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In This Issue

Morris Blum Remembered As Pioneer

by Randy J. Stine

ANNAPOLIS, Md. From the time he founded WANN(AM) in historic Annapolis in 1947 until he sold it in 1997, Morris H. Blum used his radio station to champion human rights in a city that, years before, had served as a slave arrival port.

Blum died of cancer on March 20 at his home in Annapolis. He was 95.

Friends and family say Blum, a white radio station owner, helped propel a music revolution. He played music by black performers and aimed at black listeners, before most broadcasters had accepted such practices; he hired African-American announcers long before there were equal opportunity laws.

"My father was one of the last self-made broadcasters. He believed broadcasters should be morally and technically qualified to run their facilities. More so than anything else, he believed in human rights and racial equality," said Blum's son, Dr. Larry Blum.

When Morris Blum founded WANN he began by broadcasting big band music and sports, but within a year settled on a format of gospel, soul and rhythm and blues, the younger Blum said.

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NEWS ANALYSIS

Digital Radio Vote Is Yes: NRSC OK's IBOC Standard

by Leslie Stimson

LAS VEGAS White smoke has emerged from the chimney of the National Radio Systems Committee.

Marking a significant milestone in an industry effort that has occupied more than a decade, the NRSC, sponsored by commercial broadcasters and the consumer electronics industry, adopted a standard for in-band, on-channel digital audio broadcasting in the United States. It is seen as a codification of the Ibiquity Digital HD Radio IBOC system, now being implemented by some broadcasters. Technically, HD Radio is a "specific implementation" of the new standard that it spawned.

The adoption "will pave the way for the radio industry to accelerate its transition to digital broadcasting," the group said in a statement. "Digital radio broadcasting is

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NEWSWATCH

Digital Gear Grant Deadline Extended

WASHINTON The Corporation for Public Broadcasting has extended the grant application deadline for stations seeking digital conversion funds. The deadline is now May 27 instead of April 29.

A CPB spokeswoman told Radio World the deadline was extended to give applicants time to prepare proposals after returning from the NAB convention because what they see at the show is a big influence on their tech decision-making.

The CPB board earlier this year approved an allocation of $14 million to fund the Digital Radio Conversion fund for fiscal 2005.

The funding levels for individual grants are unchanged from the previous grant rounds. A CPB-qualified licensee may apply for a grant of up to $75,000 per transmitter converted, but the total grant may not exceed 70 percent of the total eligible digital conversion cost. Minority and Level 5 rural stations may apply for a grant of up to $85,000 per transmitter converted, but the total grant may not exceed 80 percent of the total eligible digital conversion cost.

The deadline to apply is May 27. For a form, go to: *www.cpb.org/grants/digital-radioconversion/*

Drug Certification Needed for Multichannel Requests

WASHINGTON National Public Radio has reminded stations they must include an anti-drug abuse act certification in their application when they apply for permission to split digital signals into several channels. Roughly 30 stations had applied by mid-April, according to NPR, which expected that number to increase.

According to the FCC, the certification must accompany Special Temporary Authority and other non-application-form requests.

An officer of the station must sign the certification. The drug certification apparently is not new; it's required by the Anti-Drug Abuse Act of 1988.

NPR has placed additional information about the certification on its engineering Web site: *www.euonline.org*.

Carolina Pubcaster Tests Three SAP Streams

CHARLOTTE, N.C. WFAE(FM) in Charlotte has conducted a live test of three supplemental audio channels over HD Radio, according to Broadcast Electronics.

Other public stations have conducted live field tests of two channels. What differentiates this field test of the Tomorrow Radio concept, BE indicated, is that the FM digital signal was split into three streams: the main stream at 64 kbps and two supplemental audio channels at 16 kbps each.

The FCC brought new attention to the multichannel concept with its recent clarification of how to apply for experimental licensing to broadcast SAC services.

The WFAE test used a Broadcast Electronics IDi 20 importer to provision the HD Radio bandwidth required for multicasting. Listeners could hear the channels using a prototype Kenwood receiver. The station recently acquired a multiple-unit transmission package through S.C.M.S.

Roger Sarow is general manager of WFAE(FM). Jobie Sprinkle is DOE.

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NAB2005 Photo Gallery

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Photo by Bob Kovacs

Joerg Eyding, center, and Migel Jara, right, of INRESA visit with Chris Crump at the Comrex booth. The manufacturer promoted its new BRIC technology, which uses the Internet for audio delivery.

Photo by Paul McLane

Cumulus engineers show off their manicures. See page 4 for an explanation.

Photo by Bob Kovacs

Mark Miller and Vincent Scala of Voice of America check out a Wheatstone D-4000 radio console. NAB said estimated show attendance was 104,400, up from 97,500 last year.

Photo copyright NAB

Dr. Robert Pepper, acting chief of the FCC Office of Strategic Planning and Policy Analysis, keynoted the Broadcast Engineering Conference.

Photo by Bob Kovacs

Multicasting was a big topic of discussion in Las Vegas. Chuck Lakaytis of Alaska Public Broadcasting listens to Wendell Lonergan explain Nautel's demonstration of digital reception of multiple stereo programs using Tomorrow Radio technology.

Photo by Bob Kovacs

Some broadcasters came to NAB with questions about the trend of podcasting and how they could offer podcasts of programs. Grant Paley of OMT demos the iMediaLogger Podcaster for Rich Habedank of C-R Media.

NRSC-5: Radio's Step Forward

Much will be written and argued about in coming months over how best to put the HD Radio IBOC system to work. Let's pause, though, to appreciate the accomplishment represented by the NRSC's approval of a standard.

The past 15+ years have seen a great deal of sweat, investment, angst and hard feelings. The vote by the NRSC marks a significant milestone, the closing of an important chapter. Radio's immediate technological future, the vote tells us, will be played out within certain boundaries and with certain assumptions intact.

IBOC is not a perfect solution; none exists. But in a time of almost frightening change in consumer behavior (frightening to existing stakeholders like broadcasters), and with daily technology advances competing for the attention of Americans, NRSC-5 offers broadcasters a luxury: the ability to transition to digital on radio's own timetable, as a choice not a mandate, and as smoothly as possible.

Don't overlook how important this is. Not long ago we weren't sure whether our industry would be fighting our battles from the comfort of the familiar AM and FM bands. Now, as we worry about the impact on consumer behavior of podcasting and streaming and WiMax, while we work to figure out how to add new program streams and song titles and visual data, let us be grateful that our existing, familiar — and profitable — infrastructure remains intact, bolstering (and employing) us while we figure out where to go next. Radio has a great asset here,coming from a position of strength.

If further evidence of the appeal of this approach is needed, consider what's going on in TV. Two days after the NRSC vote, the NAB put out a statement calling on the FCC to "reject the Consumer Electronics Association's effort to delay implementation of FCC rules designed to encourage the rollout of digital television." It was one more reminder that, while radio and consumer electronics companies have so far been able to compromise and move forward, TV's digital rollout continues to hit potholes.

Readers of this column know that I take strong exception to the manner in which NRSC conducts its work. A process that claims to be open, but which closes its doors to trade journalists, is not. We journalists are the nearest thing you have, if you can't take part yourself, to an impartial observer to monitor the standards proceedings. Shutting us out limits your ability to judge that work.

However, my feelings about the process do not prevent me from saluting the people who have made such a vital industry contribution. The NRSC's members deserve our thanks and congratulations. If you don't think so, imagine what we'd be discussing if our standards-setting process was in the hands only of the FCC, without an NRSC to advise it.

And Milford Smith reminds us of another important point about the AM side of this whole equation. He calls HD Radio an "astounding technological breakthrough" for AM listeners. It's exciting to have that kind of language used about the senior band.

Certainly, settling a standard only allows more questions.

How will radio market this new "thing" it has in its hands? What do we tell listeners; what words do we use?

Is it "a display that tells you what song you're hearing"? Is it "multiple radio stations, where once you heard one"? Is it "the ability to hear fabulous audio where before you heard noise and multipath"? Is it all of the above? What words should we try to put into the mouths of electronics retailers? What exactly is the new offering?

Based on my conversations at the show, no consensus exists about precisely what we do with it next. But the point is, we have choices.

Another way of looking at this is that radio now is focused on how, not whether, to use its existing bandwidth more efficiently. That is a significant accomplishment. Ibiquity, its predecessor companies and the IBOC proponents who fought with, and next to, each other have helped make this happen.

Cumulus engineers were in for a little surprise in Vegas: a makeover, courtesy of boss Gary Kline. Here, Nashville DOE Troy Pennington, former president of the SBE, spiffs up.

Virtually everyone I talked with at NAB senses that HD Radio has passed a vital junction. Continental Electronics VP of Engineering Dan Dickey summed up what I heard from many when he said, "Clearly, this is the year for digital radio."

Now it's not a question of "if," but "when" and "how."

★ ★ ★

We'll report our Radio World "Cool Stuff" Awards in a future issue; but my pick for "Cool Management Idea" goes to Gary Kline of Cumulus, who surprised 18 or so engineering employees at NAB with a serious pampering.

The engineers were told only that they should report, two by two, to a room in the Hilton for a meeting on Saturday. They walked in to find they were being treated to a haircut, manicure, facial and massage, in addition to a gift bag of personal care products; then the group was taken to dinner and the Howie Mandel show.

Kline cooked up the makeover project with the help of the company's director of marketing after joking around with executive John Dickey about it. At first Kline worried that the engineers might be weirded out about getting such treatment; but afterwards he told me they enjoyed it a great deal. It certainly generated lots of talk and joking among the Cumulus crew.

Kline's goal was two-fold: to make the engineers feel appreciated; and to reinforce his message that "you're not (just) an engineer; you're a department head, you're a manager." Awareness of personal presentation, he said, is vital for engineers who are assessing company goals and interfacing with other professionals.

Good for Cumulus. The company also deserves kudos for paying to bring a big group of its engineering team each year, for setting up an informative engineering meeting during NAB and for having CEO Lew Dickey come to the meeting to talk about the company's goals with the engineers. That kind of action denotes a fundamental respect for the profession of radio engineering.

From the Editor

Paul J. McLane

NRSC

▶ Continued from page 1

expected to offer a wide variety of new entertainment, information and data opportunities for broadcasters, receiver manufacturers, service providers and consumers."

Meeting in Las Vegas during the NAB convention, the DAB Subcommittee of the NRSC accepted the recommendation of a working group and adopted the standard, called NRSC-5. Although it is voluntary — meaning manufacturers don't necessarily have to build to the specifications — NRSC members expect the FCC will use it to complete its digital radio authorization and that manufacturers will adhere to the standard in building their products.

Charlie Morgan, chairman of the National Radio Systems Committee, and Milford Smith, co-chairman of the DAB Subcommittee, said the standard delves into various aspects of HD Radio.

Smith said, "It's a blueprint for our HD Radio system, a single point of reference with hundreds of pages of appendices with technical information." Most important, he said, the standard provides certainty for broadcasters, receiver manufacturers and data providers who have been hesitant to join the conversion.

After the April 16 adoption was a 10-day period to file appeals, after which the document was to be published. The co-sponsoring bodies planned to deliver it to the FCC and eventually publish it on the NRSC Web site.

Yet the work of the committee is not done.

Now members are focused on ancillary data services possible with IBOC. They need to work out whether a broadcaster or third party can inject the data — traffic, weather or other services — on their own or whether they must involve Ibiquity to accomplish that, said an NRSC member.

The standard includes a "placeholder" intended eventually to be replaced with sections relating to advanced applications, Smith and Morgan said, including an interface for manufacturers to provide for multiple data applications. This portion of the standard will govern ancillary data product not directly related to program-associated data, said Morgan.

Codec dispute

Some behind-the-scenes lobbying was needed before the standard could be approved, because the document does not include a codec specification.

It became apparent in the weeks before the vote that some data-provider and chipmaker members of the DAB Subcommittee felt that a transmission standard would be incomplete without specifics about Ibiquity's HDC codec.

Dispute among engineers representing various IBOC interests is not unusual. But the debate raised questions about the usefulness of a standard as proponents try to continue the momentum of the rollout.

The groups working on various parts of the standard represent receiver makers, semiconductor manufacturers, broadcasters, transmission equipment vendors, data providers and Ibiquity Digital itself. Many have long-time investments in Ibiquity and its technology or seek some sort of business venture tied to IBOC and Ibiquity.

Several committee sources, speaking confidentially to Radio World, said that while previous efforts to evaluate the system went well, the standard-setting effort became political as the vote approached. Some say it's notable that disagreement over a fundamental question such as whether to include a codec spec had festered for so long.

More than a year ago, the NRSC essentially forced Ibiquity to change the codec, saying the version of PAC being used created unacceptable artifacts in the AM audio at certain bit rates. That decision slowed the standards-setting process.

Ibiquity in summer 2003 switched to its new HDC codec, thought to be a variation of aacPlus with Spectral Band Replication, but declined to reveal specifics to the NRSC and the public in February 2004, citing contractual reasons.

Although they would have preferred that the standard include the codec, Morgan and Smith said, DAB Subcommittee leaders decided to leave it out.

"The NRSC was faced with a decision whether to go forward or to hold out for the codec," said Smith. "It became obvious to us if we held out for the codec, there was going to be no standard. Period."

Another source said, "Ideally, the digital standards for the U.S. would have been developed in an open process. But that was not the case here. We had a company that spent a lot of money developing a technology. Then we forced them to switch codecs.

"It was 'game, set, match' when the FCC came out with the interim authorization that said IBOC was going to be the digital standard for the U.S."

Regardless, the source said, a year from now no one will care about the specifics of the vote. The larger issue is "making sure Ibiquity is supportive of integrating ancillary data services" into its system. Referring to terrestrial radio's challenge to remain relevant in an era of entertainment on demand, the source said, "Time is moving along."

But some committee members long have felt that a standard would be incomplete without codec details. "Anybody who thought it was settled was premature," a source said not long before the convention.

The point of an engineering standard is to provide specifications that contain enough detail to allow someone "skilled in the art" to make a working system, according to the NRSC. To leave out the codec, critics said, makes the task more difficult — because chipmakers, for example, cannot maximize the power and speed of their chips for specific applications.

Those who reject this view point to Philips and Texas Instruments, two companies that are shipping IBOC chips to receiver makers.

However, those companies are using standard chips and putting Ibiquity's code onto them — not as efficient as the process could be, according to this view. And there are fears that, though other codecs theoretically could be used, the Ibiquity version would become a de-facto standard, shutting out others.

"You do a standard so you have a common platform from which to build product," one source said. "Having a standard enables competitors to compete on a reasonably level playing field." And as more receivers and transmission products are built, the price would come down.

The parties expressing concern said they do not begrudge Ibiquity the right to recoup its investment; yet in an open standards-setting process, keeping key information secret is unfair and gives the developer a monopoly on IBOC transmission and royalties long after its patents expire, they argued.

Ibiquity has in fact agreed to license its software under "reasonable and non-discriminatory terms," sources said, and to disclose additional patent information related to the transmission and receive ends of the system so that NRSC-5 may be implemented, while retaining for Ibiquity a strong intellectual property position. This compromise was reached days before the vote.

◆ NEWSWATCH ◆

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KUVO Airs Pledge Drive in Surround Sound

DENVER It's one thing to air a special concert in surround sound, but a pledge drive? That's what Denver's KUVO(FM) did when it recently broadcast its spring drive in 5.1 surround sound using Neural Audio technology.

"When your listeners know that their donated dollars are actually impacting their listening experience while making history, this translates to a positive experience for our donors: which is good thing," stated Mike Pappas, chief engineer for KUVO. "Our listeners are very motivated and their contributions help us to continue our transition to HD Radio."

Pappas and KUVO have been early, active proponents of surround; in addition to airing a concert in surround last fall, the station was part of the New Year's Eve "Toast of the Nation" broadcast on NPR.

During the nine-day pledge drive, Pappas and his engineering staff used a NeuStar 5225 Mix-Edit Transcoder to create 5.1 surround sound for their digital broadcasts. The supplier says the transcoder enables broadcasters to mix, edit, save and transport 5.1 content via Neural's proprietary "watermarking" system on existing 2.0 stereo equipment.

Yamaha to Ship IBOC Receiver In June

BUENA PARK, Calif. Yamaha will ship a 7.1 channel home theater receiver with HD Radio capability to stores in June. Radio World reported on the product in earlier coverage of CES.

The RX-V4600 is an A/V digital home theater receiver with HD Radio technology and Yamaha Parametric Room Acoustic Optimizer technology that the company says simplifies the home theater set-up process. It analyzes room acoustics and sets parameters for optimum sound quality at the listening position.

The receiver includes the Circle Surround II decoder from SRS Labs. RX-V4600 will list for $1,899.95.

FIRST PERSON

RF Coordination Smooth in Athens

Recent Olympics Was the Largest Frequency Coordination Effort Ever Attempted

The author was a consultant on frequency coordination to the Greek government for the 2004 Olympic Games in Athens and frequency coordinator the 2002 Games in Salt Lake City.

by Mario Hieb, P.E.

ATHENS Greece is a wonderful country; it has beautiful islands, great food and music, and friendly people who enjoy life. Like many Mediterranean countries, the nation of Greece moves to a different rhythm. Shops close for the afternoon siesta, nightclubs don't get going until 1 a.m. and radio stations ... well, they sort of do their own thing.

Photos by Mario Hieb

RFR measurements on Mt. Parthina

Greeks don't seem to be too big on rules; in Athens, stop signs and speed limits are suggestions. Pedestrians walk in the street because cars are parked on the sidewalks. The Greeks invented debate because they love to discuss and argue, and they invented democracy because they all want to be in charge.

Regimentation is bad and freedom is good. As a result, the radio culture follows the local culture. "What license? I don't need a license as long as there is 200 kHz between stations."

Okay, this may be a slight exaggeration, but licensure for radio is a new thing to Greece.

Modern Greece

So what is the system, and how does it work?

First, there are two broadcasting regulatory agencies: the Ministry of Broadcasting, which licenses radio and (someday) television stations, and the National Telecommunications and Posts Commission (EETT in Greek), which regulates everything else. Why two agencies? Politics. And I've always said that engineering and politics don't mix; just look at the FCC.

Greeks love their cell phones. They can now discuss and debate from anywhere in the country. The EETT is a fairly new agency created to oversee this burgeoning telecommunications infrastructure in Greece, to comply with European Union regulations and to accommodate the 2004 Olympic Games.

Invented in ancient Greece, revived in modem Greece, and now back again for a visit, the Olympic games are the world's largest media event — and a radio frequency coordination nightmare. Last summer, the Games used 7,800 discrete radio channels, up 50 percent from the Sydney Olympics in 2000, according to the Athens Olympic Games Organizing Committee. The majority of spectrum users, 82 percent, were rights-holder broadcasters.

This makes this the largest frequency coordination effort ever attempted.

Now you can see the dilemma faced by the EETT. If this were ancient times, it could be one of the labors of Hercules.

Working in conjunction with the Athens Olympic Organizing Committee, the first thing members of both groups did was sweep the spectrum to see who was on what frequency and where. ATHOC established a frequency coordination Web site called *e-Spectrum*.

Having frequency applicants enter their data into your database is a godsend over the paper application. Communication is easy and efficient when the coordination database is accessible from anywhere in the world, at any time of the day.

Next, EETT issued licenses to all radio users, except radio and television broadcast. Then, it developed a plan to assign radio channels to users during the Olympic Games.

The Games took place in 36 competition venues and four main non-competition venues. The coordination area included the Attika region, Thessaloniki, Patras, Heraklion, Volos and Olympia, the site of the original Games. The main area of coordination was the Attika region, where most of the Olympic activities took place.

Pirates abound

Finally, as part of the enforcement effort for the Games, EETT implemented an advanced National Spectrum Management and Monitoring System, composed of fixed monitoring stations, mobile monitoring stations and light portable monitoring stations. The EETT contracted with Rhode & Schwartz for two fixed monitoring stations and six Mercedes monitoring trucks.

In addition, monitoring teams were situated in the venues during the Games. To establish a baseline, before the Games, teams performed sweeps in the frequency bands that would be used during the Olympics. Using triangulation from the monitoring sites and the mobile trucks, unauthorized users were located and contacted to cease operations.

Several unlicensed FM stations were operating illegally on frequencies requested by the producers of opening ceremonies.

Photos by Mario Hieb

Towers on Mt. Ymmitos

These stations appeared to operate froorm Mt. Ymittos, east of Athens.

The pirate problem here is ongoing.

On a trip to the mountaintop, the EETT hoped to pinpoint the location of these rogue stations prior to the games. The site is populated with nearly a hundred cargo containers and dozens of towers; the pirates can hide easily. If a monitoring truck enters the antenna compound, the stations suddenly shut off. Apparently a system of electric eyes and video cameras alert the illegal stations, so they can shut off until the radio cops leave the site.

Eventually, the EETT finds the scofflaws and confiscates the station's transmission equipment in a raid. But the station finds a new container and, with new equipment, is often back on the air in a few days.

The cat and mouse game begins again.

One serious issue facing EETT had to do with wireless microphones. Typically, they operate on unused television channels, but in Athens, there were nearly no unused channels.

Dr. Philip Constantinou and Elias Katimertzoglou of the National Technical University of Athens solved this problem. The solution was to assign frequencies in the visual portion of on-air PAL television signals. As long as the FM microphone signal was 15 dB or greater than the video information, capture effect would prevail, and the wireless microphone would work noise-free.

Probably the biggest surprise of the Athens 2004 frequency coordination effort was the relatively small number of interference issues that developed after the Games started. The good planning and execution of the Greek spectrum management effort was worthy of the gold medal.

Blum

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"After that first year, he discovered this large untapped African-American audience and began playing gospel a few hours a day. In addition, he played secular music from artists like Ruth Brown and the Delta Rhythm Boys and H-Bomb Ferguson. The reaction from the Afro-American community was incredible."

Blum then hired black announcers and management to help run the station, his son said.

"It was really a mix of ethnicities running the station and never exclusively African-American. My father offered equal opportunity, but not equal results. Everyone he hired knew they would be held to a higher standard, and they accepted that."

The son of Jewish immigrants, Blum was born in Pennsylvania and moved with his family to Baltimore in 1918. It was there that Blum built a "crystal set receiver out of an oatmeal box" in the attic of the family's house as a Boy Scout project, his son said.

"He found that to be so interesting … to be able to receive voices through the air. We take it for granted now, but in 1922 it was very novel technology."

Morris Blum served in the merchant marine as a radio operator aboard a tanker and later in radio intelligence for the FCC during WWII, Dr. Blum said.

"When my father returned home, he witnessed a lot of racism and recognized the barriers many in the Annapolis community faced. He loved nothing more than having guests in the air studio who had never spoken their mind freely before. This was an amazing thing for African-Americans, too," Dr. Blum said.

Carl Snowden, a civil rights activist and former Annapolis City councilman, told the Baltimore Sun that Blum "spent the better part of his life fighting against bigotry. He averted a catastrophe in Annapolis at the time of Dr. Martin Luther King's death. He opened the station and allowed the African-American community to come of the radio and voice its concern. There were uplifting comments that allayed fear here."

Morris Blum was the type of owner who paid as much attention to broadcasting standards as he did to engineering standards, said Merrill Pittman, who served Blum as chief engineer at WANN for nearly 50 years.

Blum "was inclined toward circuits," Pittman said, "meaning, he knew if something went bad he knew sometimes I wouldn't be able to put my finger on it right away. He had a lot of tolerance that way."

Pittman joined WANN in 1949 as a transmitter engineer and eventually became chief engineer. He said Blum was a hands-on owner.

"There was no corporate ownership structure or anything. If I needed to discuss something with him I went in his office. I could get things done much quicker that way," Pittman said.

John Bisset, regional sales manager for Broadcast Electronics Inc. and a Radio World columnist, said Blum once hired Bisset's fledgling contract engineering firm to rebuild the station's directional antenna site.

"He would come every day to inspect our work but always complimented us on something. He also gave me the best business advice ever. He told me, 'Just remember John, in some cases you'll make more money by not working for certain owners,'" Bisset said with a chuckle. "Sage advice for all contract engineers."

Blum was appointed to the FCC's National Industry Advisory Committee in 1958 and served on subsequent commission committees through the years, said Frank Lucia, former FCC director of emergency communications and senior advisor, Emergency Alert System.

Lucia said Blum's volunteer roles on FCC committees included working on the deployment of CONELRAD, the Cold War predecessor to EBS and EAS; the development of the two-tone Emergency Broadcast System attention signal; and field tests to develop the current EAS.

"He was a wonderful generous person who will be missed by all personally and professionally," Lucia said.

Lucia said Blum also served as the

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Morris Blum, left, and successor Jim Weitzman in September 2004 when WANN Annapolis, Md. ceased broadcasting from the site it used for more than 50 years. The towers were toppled and the site abandoned. The station, renamed WBIS to reflect its business radio format, is now operating under an STA from another site in Annapolis.

Virgin Launches Global 3G Service

by Mark Dezzani

LONDON Commercial broadcaster Virgin Radio has launched a global 3G mobile phone-based radio service.

The service uses technology supplied by Singapore-based Sydus, which specializes in mobile music streaming technology.

Launched in March, the service makes Virgin Radio available globally on newer mobile phone platforms, such as 3G.

Streaming technologies

Although streaming audio from the Internet to mobile phones theoretically has been possible for some years via Windows Media Audio, RealPlayer and other software, some mobile providers have blocked use of some of these technologies.

In 1998, several major mobile phone companies including Nokia, Ericsson, Motorola and Psion formed a consortium to develop Symbian OS, an operating system developed specifically for mobile phone networks such as 3G. Over the years, the consortium has grown and Symbian OS phones have come to market.

Sydus music streaming technologies are among the first developed to work on the Symbian OS. In addition to its own compression codecs, Sydus provides streaming technology compatible with Windows Media, Advanced Audio Compression, aac-Plus and Ogg Vorbis.

"This is the first end-to-end system purpose-built for streaming high-quality radio for mobile networks," said Sydus President Saumil Nanavati.

"While most other systems have been designed for fixed Internet connections," said Nanavati, "our technology has been adapted to work on different phones, to cope with multitasking, such as playing games while listening to audio; to work well in weak network spots; and to deliver quality sound."

According to Nanavati, the 20 to 30 kbps stereo stream is comparable in audio quality to somewhere between 128 kbps MP3 stereo and FM broadcast quality.

An early adopter of new digital distribution platforms, Virgin Radio is providing three 3G streams, featuring its modern rock national AM network and the digital-only channels Virgin Radio Classic Rock and Virgin Radio Groove.

Adding broadcast platforms has long been a part of the Virgin Radio strategy. In addition to its national coverage on AM, Virgin Radio broadcasts on FM in the London area, and it is available via DAB, which uses the Eureka-147 technology for digital radio transmission, cable and satellite on the Sky Digital and WorldSpace platforms.

"The days of just one or two broadcast platforms are gone," said James Cridland, head of new media at Virgin Radio. "Virgin tries to be platform-positive."

In the past, Cridland said, Virgin Radio had just FM and AM outlets. Now, there are new delivery platforms such as podcasting, DAB and 3G.

"We embrace new platforms and, through each new platform, we reach a new audience," he said.

Cridland described the launch of its 3G streams as a success.

"The Sydus technology works very well, the audio quality is good and we have had thousands of software downloads already, he said. "It is not the easiest thing to install streaming technology on a mobile phone so it shows that people desperately want radio on their mobile phones and will jump through hoops to get it."

Using Sydus-developed software, listeners can tune three Virgin Radio channels via a 3G mobile telephone.

Monthly fee

Sydus supplied a turnkey operation for Virgin Radio from the back-end server side to the front-end application download side. Virgin Radio houses its own server connected to backend servers operated by Sydus around the world.

According to Nanavati, Sydus technology is less expensive than DAB.

"DAB is good for regional and local areas," he said, "but this is a perfect medium for 24-hour global reach." It is also different from Internet streaming, which is mainly fixed to the home and office. In addition to 3G, it also works across all 2.5G and 2.75G wireless networks.

Although 3G networks have been being introduced around the world over the past few years, the supply of multimedia content for 3G telephones has focused mostly on games and video. According to Cridland, the availability of radio content will help boost sales of 3G mobile phones.

"There have not been enough interesting content choices so far," Cridland said, adding that uptake for services like his are likely to be popular in markets such as the United States, India, Thailand, Singapore, China, Italy and Australia, where there is a fixed monthly fee for unlimited data bundles.

In the United Kingdom, at press time, mobile phone providers charge customers according to data transferred

"We are talking to major mobile providers in the United Kingdom to see how we can work out cheaper or fixed-fee rates. In India, for example, you can have unlimited GPS data for just $8 a month," Cridland said.

According to Cridland, 647 million mobile phones were sold around the world last year. That means 647 million new listening devices.

Some 30 mobile phone models from Nokia, SonyEricsson, Siemens, Sendo and other manufacturers can download and run the free Sydus player software.

"This is where the future is for radio listening. People can hear what they want, where they want," he said.

"There is a huge interest in mobile phones. They will be an integral part of the future and Sydus is among the first to provide this technology enabling broadcasters to tap this market."

Blum

▶ Continued from page 7

first chair of the Maryland State Emergency Communications Committee. "He never failed to volunteer to work on projects that affected emergency communications. He felt strongly about public service."

Jim Weitzman, who purchased WANN from Blum in 1997, said Blum "was constantly working on projects to advance programming, public service and the technical aspects of our industry. He was very well respected for his contributions to broadcasting."

Even when he sold the radio station in 1997 and "retired" at the age of 88, Blum's knowledge, wisdom and advice were often sought, Weitzman said.

"He was a mentor to many, including myself, and a 'mensch' of the first order," Weitzman said, using a Yiddish word for a person of admirable character.

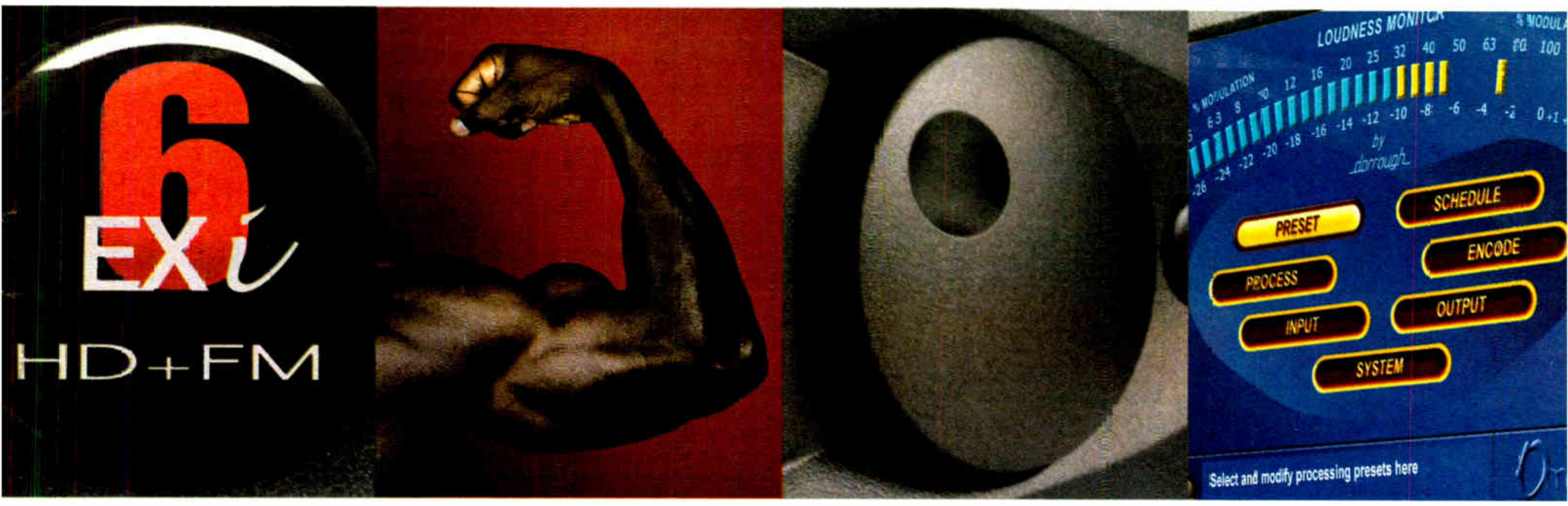
Dr. Blum said his father faced a backlash from some segments of the community through the years for serving the African-American audience in Annapolis.

"He was always admired more from afar than from the immediate Annapolis area. The movers and shakers in Annapolis had no regard for him. People looked down upon my father and viewed him as being just a step above running a grocery store in a ghetto neighborhood."

WANN's format changed to country in the 1990s to keep up with shifting demographics before Blum sold the station.

Dr. Blum said his father was satisfied with his accomplishments in life and broadcasting.

"What other people thought of us really didn't matter. He fought bigotry his entire life. However, first and foremost he believed public service should not be ignored and forgotten. I think he left his mark on a lot broadcasters."



Omnia 6EX*i*

The Ultimate Upgrade.

Omnia-6 is the standard by which all other processors are measured. In the last few years, thousands of leading stations in the world's top markets have upgraded to Omnia. In fact, Omnia-6 has been so successful that some competitors have just given up; others are mere shadows of their former selves.

So why do broadcasters love Omnia-6? The *sound*. The clean, pure, crystal-clear sound (bone-shakingly loud, if you want) that's become the choice of #1-rated stations in New York, Los Angeles, Tokyo, Paris, London, Rome, Sydney and Beijing. The other guys tried to match its winning sound... and failed. So they've settled instead for trying to copy its innovative features.

Features that Omnia pioneered — like dual, simultaneous processing paths for HD Radio™ and conventional FM. The world's only non-aliasing digital clipping system, with composite clipping for the ultimate in competitive loudness. The high-precision Multi-Band Look-Ahead Limiter (invented by Omnia) for perfect HD Radio processing. The six-band limiter for conventional FM, with adjustable crossovers for surgically-precise control over your signature sound. An integrated Dorrough™ Loudness Meter. And of course, the groundbreaking 96 kHz, 24-bit platform that delivers full 20 kHz bandwidth for HD Radio broadcasts. Always innovating.

Which is why the **new Omnia-6-EX*i*** makes perfect sense. With **integral HD Radio Diversity Delay** that helps digital broadcasters eliminate analog connections to the HD exciter, ensuring independent analog and digital program streams. And the exclusive new **LoIMD Clipper** that actually **suppresses intermodulation distortion** to deliver audio that's cleaner, clearer and more detailed than ever — no matter how aggressive your processing. (If you already own an Omnia-6, don't worry – there's a low-cost upgrade to give your processor full-fledged Omnia-6EX*i* power.)

A lot of muscle? You bet. No wonder the competition is running scared.

Omnia
A Telos Company

OmniaAudio.com

No-Bull Tips for Transmitter Sites

by John Bisset

Ever have equipment installation interface problems? Here's one solution.

Mark Ward is chief at WTSN(AM)/ WBYY(FM) in Dover, N.H. Last summer, his stations received a windfall in the form of a Comrex BlueBox and Matrix. These units provided the stations with a quantum leap in the audio quality of remote broadcasts, compared to conventional analog POTS or cellular phone service.

When used for commercial remotes on the FM, installation was straightforward, with a mix-minus feed from the audition bus of the console straight into the BlueBox.

The AM presented a challenge, however. One of their goals was to use the Comrex for live call-in talk shows while the host was at a remote location. This would require three busses on the board: program to feed the transmitter, audition to feed one mix-minus to the BlueBox, and a telephone bus to feed a different mix-minus to the telephone hybrid. Alas, the AM station's mid-1960s board has but two busses; and any source can only be assigned to one bus at a time.

Mark created a list of "who needed to hear whom":

1) the remote host needs to hear the callers, as well as cues from the board operator;

2) the callers need to hear the remote host; and

3) the audience needs to hear the remote host, the callers and all the other elements of the show.

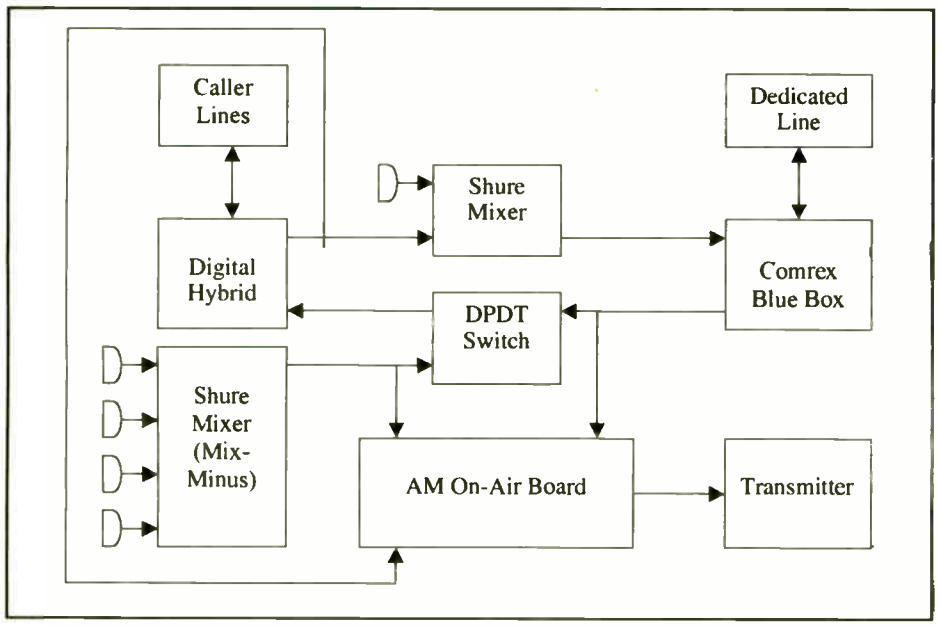


Fig. 1: Mark Ward uses this simple mod to customize a Comrex application.

The first requirement was met by wiring a Shure mixer into the BlueBox line input. This mixer was fed by the caller output of the hybrid on the line input, and a local mike for cues. Mark already had installed another Shure mixer for in-studio guests and wired its line output into the send input of the hybrid to provide a mix-minus for the callers when the show was at home.

A double-pole, double-throw switch was inserted to select either the in-studio mix-minus mixer or the BlueBox to feed the hybrid, thus satisfying the second requirement. Finally, the BlueBox line output was wired into the board to complete the installation. Fig. 1 shows the wiring interconnect.

Fig. 2: Tower for Sale — rowboat included.

Operationally, some remote hosts prefer to have the local mike open all the time, while others find hearing the (delayed) return of their own voices, from the studio speaker, distracting. Care in setting audio levels both ways provides excellent results. Mark operates exclusively in "voice" mode, which provides 7 kHz audio bandwidth at any data rate from 14.4 kbps on up.

Typically, the initial connection will be established at 19.2 to 24 kbps, but they drop the rate down to 16.8 kbps before air, and "retrain" the Comrex hourly during long remotes, to allow some margin for error correction of the telephone line.

Note that if errors aggregate beyond a certain threshold, the Comrex will perform a "retraining" by itself, with an accompanying loss of audio for 10 seconds, which can seem like an eternity.

See NO-BULL TIPS, page 12 ▶

WIRELESS REMOTES NOW

Tieline's broadcast quality GSM codecs now come with up to...
15,000 FREE* GSM minutes!

Choose any GSM mobile plan and we will contribute towards your first bill. This potentially could be worth up to 15,000 FREE GSM minutes.

The Tieline GSM module slots into the Commander G3 or i-Mix G3 codec and works in all GSM coverage areas throughout the USA and in over 200 countries around the world. Insert your SIM card and you're ready to broadcast.

You can even remote control your talent's audio input level from the studio during your broadcast.

Contact Tieline Technology to order your free demonstration today.

"Compared to what we were using before, Tieline GSM is better hands down.

We're pleased with the performance and quality.

We purchased the Tieline GSM system primarily for remotes and our morning show on the road."

- Randy Mullinax
(Tyler Broadcasting, Oklahoma City)

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*This special limited offer valid when you purchase any two Tieline Codecs and at least one Tieline GSM module. Tieline will include a $50.00 rebate voucher in your codec purchase which is redeemable on return to Tieline with a valid purchase receipt from your broadcast dealer. The $50.00 voucher holds a potential value of up to 15,000 FREE GSM minutes. Based on a major national cell phone carrier's plan.

No-Bull Tips

▶ Continued from page 10

Consensus among those concerned is that this is the way remotes should sound — "like you're in the room."

Asked for comment on this tech note, Comrex called it a clever way to solve the problem. The company notes that its Mix Minus Bridge is designed to scratch this itch; it costs $1,500, so it's a more pricey solution, but it may save time.

Mark Ward can be reached at *mark@am1270wtsn.com.*

★ ★ ★

Here's a site to keep bookmarked for finding obsolete RF connectors.

Aviel Electronics, a division of RF Industries, can fabricate functional equivalents for most RF coaxial connectors and adapters that are obsolete, discontinued or no longer available.

The connectors come in all common miniature interfaces, including SMA, SMB, SMC and MCX, as well as larger interfaces such as BNC, TNC, N, C, SC, HN, LT and LC. Typical body materials include brass, stainless steel and aluminum. The connectors can be plated with gold, silver or nickel; and can be anodized or olive drab. Body configurations include straight, right angle, bulkhead, flange mount, blind-mate, tri-axial and others.

The site is *www.avielelectronics.com*, and you can contact the factory with your requirements at (702) 739-8155.

★ ★ ★

Fig. 2 on page 10 shows another transmitter site road — or in this case, "road."

The engineer submitting the picture asked to remain anonymous, for obvious reasons.

It seems the previous owners wouldn't spend any money on the site, other than to keep it on the air. A real road to the tower has since been put in.

Fig. 3: Rain and loose rocks don't mix

Fig. 4: Thwart site vandals. Order your guard buffalo today.

Wouldn't you love to see the FCC check the base ammeter calibration at a site like that?

★ ★ ★

For Bill Agresta, chief of Crawford's KBRT(AM) in Los Angeles, as for many engineers in California, landslides have become an everyday occurrence. This makes driving old mountain roads dangerous. Fig. 3 is an example. This was taken *after* rocks were cleared from the road.

Wet weather brought other problems, too, like keeping a ground system in place. It's a battle to keep rain and wind from washing radials away. Bill also has had to be creative in keeping ATU components dry at the base of the tower.

Then there's the problem of local wildlife. Bill saw an unusual sight out his home's back window, and shared it in his group's engineering newsletter. See Fig. 4. He's considering this "no bull" approach to keeping vandals away from the transmitter site.

Thanks to Bill and Crawford DOE Cris Alexander for sharing photos.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386, or jbisset@bdcast.com.

Submissions for this column are encouraged, and qualify for SBE recertification credit.

First Broadcasting Upgrades Coverage In Memphis

First Broadcasting has upgraded the signal of its oldies station on 95.3 MHz in the Memphis market.

The group bought the Class A station in 2004 from DeSoto Broadcasting Co. and has since installed a Harris transmitter with an ERI antenna at a new site. Using in-house software tools to do the coverage research, they said, they were able to develop a plan to move the transmitter and tweak power within the station's license limits.

Executive Vice President of Technology Alastair Westgarth said the project involved "some power adjustments, as well as finding a tower location that made zoning and commercial sense." He called it a "secret sauce" mixture taking advantage of an opportunity that the company had identified using custom allocation software.

"Some of the pure allocation tools are great to know about your contours, but tricky when analyzing type and quantity of interference present," he said. The company's propagation software allows it to better measure the levels of interferers, he said.

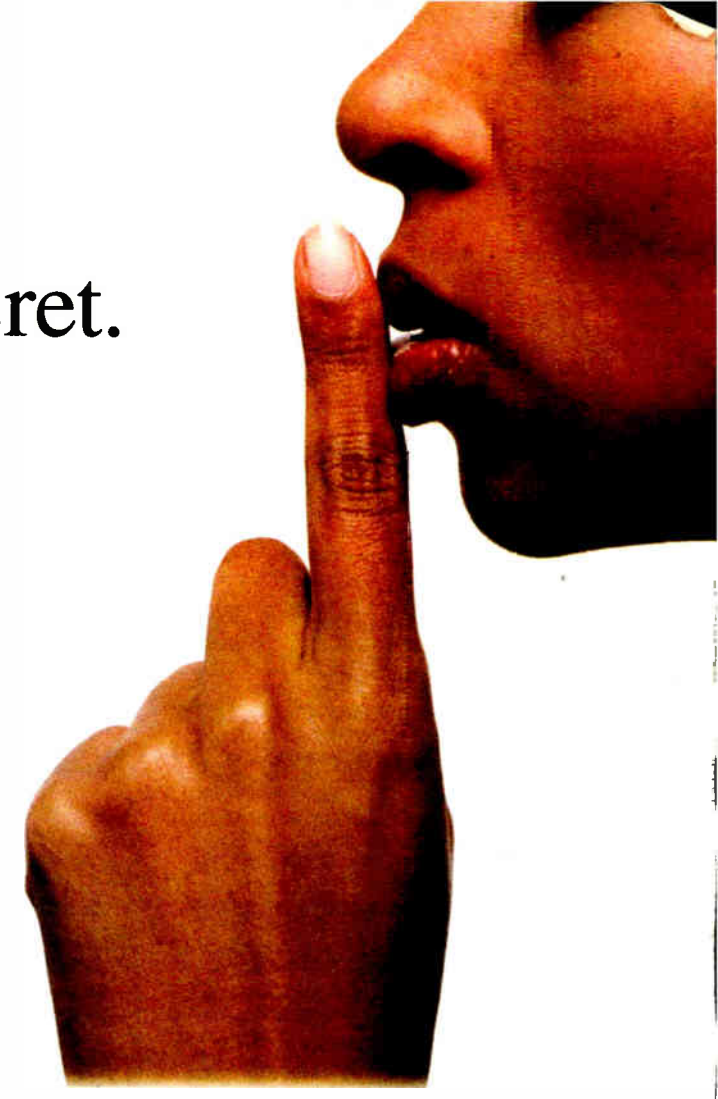
"There's a clear-channel second adjacent downtown in Memphis," he said. "They pulled that signal in from another location, and that opened an opportunity."

The company said the signal now extends from Bartlett, Tenn., in the north to Tate County, Miss., to the south. The station reaches 10 counties in three states, an area with more than 1 million people.

"The location of the transmitter site in Hernando, Miss., takes advantage of ideal terrain conditions and enabled First Broadcasting to extend the signal to cover substantially all of the Memphis metropolitan area," it stated.

Rick Dames is general manager of the station. First President/Vice Chairman Gary Lawrence said the Memphis-area radio audience is increasing at almost 5 percent a year. Memphis is Arbitron market 46.

Our client list is secret.



Every day, more than 750 broadcasters rely on TWOx12 twelve-line phone systems to insure their critical talk radio programming. Two advanced digital hybrids deliver the best caller audio possible, thanks to our famous Digital Dynamic EQ. Status Symbols visual call management (a Telos exclusive) helps producers screen calls easily, without guesswork.

Planning a big, consolidated build-out? Consolidate your phones as well with Series 2101, the world's only multi-studio talkshow system. Series 2101 lets you expand your facility's call capacity when needed — allows control of up to 96 callers and 32 studios. Not only that, Series 2101 uses high-quality digital phone lines to deliver caller audio that's next-room clear (and help reduce Telco wiring, too).

At Telos, we're all about choices. Take our Desktop Director (right); it works with TWOx12 and Series 2101 systems, can be expanded to control up to four hybrids or up to 24 lines when used with Series 2101, and has a built-in handset, speakerphone and headset jack. Or, choose the new Call Controller (left) and "bring your own phone" for screening... even works with wireless phonesets.

ONE-x-Six is perhaps the world's most popular auto-nulling multi-line phone system. Also the world's most affordable! Like all Telos talkshow systems, ONE-x-Six integrates with our optional Assistant Producer software to allow fast, intuitive remote screening via LAN or WAN connections.

Naturally, we are obligated to protect the identity of clients who use Telos talkshow systems. We would no doubt get a Stern warning from any user whose name we revealed.

But rather than Rush to superlatives, let us just be Frank'n get to the point. When you're ready for the world's best talkshow system, the answer is Clear; it's as easy as ABC. Whether your station is located in Salem or Susquehanna, Telos has a broadcast phone system just right for you. Why, the possibilities approach Infinity.

In our eyes, reliability is King. After all, if there's a failure, you can Kiss your ratings goodbye. You need your phone system to be a Citadel of Mega reliability. Not to Mix metaphors, but you need something Hot, Lite on the pocketbook, and full of Power. Really, it's Radio One-oh-one.

And unlike gear with tech as dated as an old Bonneville, Telos talkshow systems undergo constant improvement. With us, it's a never-ending Saga of advancement.

Telos. Striving for Greater Media through advanced technology.

(And don't worry... we'll keep your secret.)

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HD Radio News

Radio World | Covering Radio's Digital Transition | May 13, 2005

Outlook for Consumer DRM Receivers

Page 18

FIRST PERSON

Viewing IBOC Through History's Lens

A Radio Veteran Ponders HD Radio And Asks Questions of Ibiquity

by Ed Montgomery

The author has been teaching electronics and communications for 34 years. Here he provides his perspective on the unfolding events involving HD Radio technology.

One should not fall behind the technology curve, yet terrestrial broadcasting seems to be in that bind. Local radio was once the first source for news, information and entertainment; but listening habits are changing. This is the age of the Internet and DBS broadcasting. Satellite radio requires a subscription fee, but more and more people are willing to pay for it. The service is showing up in new cars and the younger generation is attracted to it.

Some historical perspective is in order — and, for readers who may not have been following the development of digital radio from Day One, perhaps some basic questions remain.

From the 1930s to the '50s, AM radio ruled, with older receivers producing a good sound. There wasn't much electromagnetic interference, so there was little noise in the receiver.

"Noise-free" frequency modulation debuted in 1939, the most recent major innovation in terrestrial radio broadcasting. FM had its limits operating at VHF but the development of integrated circuits and microprocessors in the 1960s made the difference for FM when those microprocessors and ICs appeared in consumer radio designs in the '70s and '80s.

Receivers could now be reduced in size and yet retain sufficient amplification to receive the signal due to improved front-end RF amplification and improved circuits with smarter demodulator and stereo decoder designs. Circular polarization contributed to improved reception. FM could compete at the same level with AM in most markets.

A more dramatic way to improve radio

The author's radio, a 1963 Zenith AM/FM stereo tuner.

Twenty years ago, the debate over AM stereo was in full swing. Those who heard it were impressed, but the battles fought over signal encoding were greater than broadcasters and receiver manufacturers could endure, smothering the desire to adopt it. The battle over which system to use, and indecision on the part of the FCC, greatly contributed to the demise of AM stereo.

At the same time, AM had primarily become a talk radio medium and music for most consumers still sounded much better on FM. AM stereo simply was not needed in the minds of consumers, so few bought it and radio manufacturers soon stopped making AM stereo receivers.

Recent decades have brought us digital processing and compression. These advances and others now allow a broadcaster to transmit a traditional analog signal along with a new digital signal with greater fidelity and free of most noise. In-band, on-channel digital radio broadcasting promises to revolutionize terrestrial AM and FM broadcasting.

would to duplicate what the FCC did with digital television using vacant frequencies and a new transmission system void of compatibility requirements; however there are no vacant frequencies being considered for such a transition in radio.

So the solution seems to be IBOC, as embodied by Ibiquity Digital Corp.'s HD Radio system.

I had my doubts about how this system would work for listeners. Anyone with a digital telephone knows what happens when they try enter a "dark" reception area; the signal mutes. Would that happen with IBOC?

I posed that question and several others to Scott Stull, Ibiquity executive director of broadcast business development. I wanted to know how this system worked.

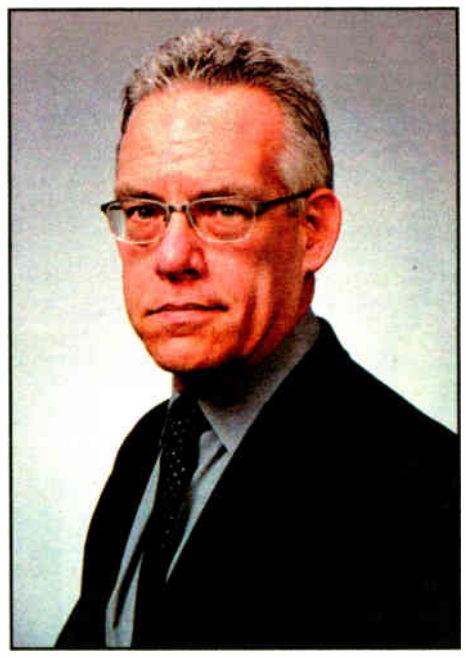
See IBOC, page 17 ▶

GUEST COMMENTARY

SRS: Matrix Surround Systems Work

by Alan Kraemer

Regarding the article "Surround: One Small Step for a Radio" by Skip Pizzi that appeared on RW Online (and in Radio World, March 2), I would like to clarify a few points.



Alan Kraemer

To begin, it seems that in every surround sound discussion for HD Radio, the word "discrete" is associated with parametric or watermark surround systems. I am not sure how this got started, but these systems are decidedly not discrete. There is no "near-discrete," "discrete like" or "almost discrete."

See SRS, page 16 ▶

Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled monthly by Radio World using information supplied by iBiquity Digital Corp. and other sources. The data shown reflect best information as of April 13, 2005. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

HD Radio at Infinity Broadcasting

Call Sign	Freq.	Format	Market	On-Air?
KCBS(AM)	740	News	San Francisco	Yes
KNX(AM)	1070	News	Los Angeles	No
KXNT(AM)	840	News/Talk	Las Vegas	Yes
WBZ(AM)	1030	Nws/Tlk/Spt	Boston	Yes
WIP(AM)	610	Sprts/Talk	Philadelphia	Yes
WWJ(AM)	950	News	Detroit	Yes
WXYT(AM)	1270	Talk	Detroit	Yes
KBKS(FM)	106.1	AC	Seattle-Tacoma	Yes
KKDG(FM)	105.9	Span/CHR	Fresno, CA	Yes
KMGV(FM)	97.9	Oldies	Fresno, CA	Yes
KOAI(FM)	107.5	Smooth Jazz	Dallas-Ft. Worth	Yes
KOQO(FM)	101.9	Span/Mexcn	Fresno, CA	Yes
KROQ(FM)	106.7	Alternative	Los Angeles	Yes
WNEW(FM)	102.7	AC	New York	Yes
WOMC(FM)	104.3	Oldies	Detroit	Yes
WPGC(FM)	95.5	CHR/Rhymc	Washington	Yes
WUSN(FM)	99.5	Country	Chicago	Yes
WVMV(FM)	98.7	SmJaz/NAC	Detroit	Yes
WXTM(FM)	92.3	Alternative	Cleveland	Yes

HD Radio in Portland, Ore.

Call Sign	Freq.	Format	Licensee	On-Air?
KMHD(FM)	89.1	Jazz	Mt. Hood Community College	No
KBPS(FM)	89.9	Classical	KBPS Public Radio	No
KBOO(FM)	90.7	Variety	KBOO Foundation	No
KOPB(FM)	91.5	Info/News	Oregon Public Broadcasting	No
KGON(FM)	92.3	Clsc Rock	Entercom	Yes
KNRK(FM)	94.7	Modern Rock	Entercom	Yes
KKSN(FM)	97.1	Oldies	Entercom	No
KWJJ(FM)	99.5	Country	Entercom	Yes
KKRZ(FM)	100.3	CHR	Clear Channel	Yes
KKCW(FM)	103.3	AC	Clear Channel	Yes
KRSK(FM)	105.1	Hot AC	Entercom	Yes
KRVO(FM)	105.9	Clsc Rock	Clear Channel	Yes

The Bottom Line

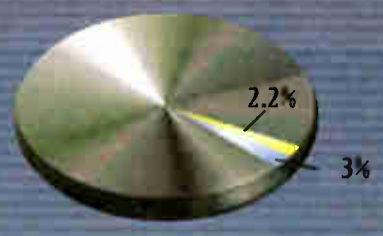
Total Licensed	On the Air
701	301

Last Month

Total Licensed	On the Air
619	244

Market Penetration United States

13,525 AM & FM Stations



Licensed by Ibiquity and on the air

Licensed by Ibiquity and not on the air

No. of Stations Licensed, Selected Owners

ABC Radio	17
Beasley Broadcast	23
Bonneville	6
Crawford	10
Greater Media	18
Maine Public Brdcstng.	7
Susquehanna	17
Univ. of Mass.	6

SRS

▶ Continued from page 14

These audio systems still require a mixdown to two channels and then using steering data, transmitted either in a digital side chain or contained in a watermark, they reconstruct the surround field at the receiving end. In theory, this is the same principal as a matrix system with the exception that the steering data is transmitted explicitly, rather than implicitly through amplitude and phase information contained in the audio signal.

Further, as Mr. Pizzi correctly points out, the parametric two-channel mixdown can compromise stereo and mono compatibility compared to a matrix mixdown. In addition, digital parametric systems are not compatible with current broadcast production infrastructures and practices, they require additional capital and integration expense, use valuable bandwidth that could be used to improve audio quality or for other commercial applications, and they cannot survive analog transmission paths.

Matrix systems, on the other hand, suffer from none of the issues mentioned above when applied to radio broadcasting. Advanced matrix systems like SRS Labs' Circle Surround significantly improve decode performance over older systems by using multi-band and variable time-constant steering to stabilize the sound field.

With systems of this type, full 5.1 or even 6.1 encode/decode capability is supported, while stereo and mono compatibility as well as functional cross capability between matrix encode/decode systems is retained. Additionally, having worked with major recording artists such as Matchbox 20, Godsmack, Boz Scaggs, Uncle Kracker and Duran Duran, we know that the matrix holds true to their creative intent.

Last and equally important, simple integration into the broadcast infrastructure, both radio and television, is ensured and has been proven for many years. The same cannot be said for new parametric or watermark surround systems.

Since advanced matrix decoders present a high-value proposition to consumer electronics manufacturers, integration of Circle Surround into automotive and home receivers is preceding rapidly with major manufacturers of both conventional and HD Radio-enabled devices such as Kenwood, Panasonic, Eclipse and Fujistu Ten.

This is creating a substantial installed base of listeners who are capable of actually experiencing a surround broadcast, which is what we are all after. The consumer experience seems to be an afterthought when some of these other systems are used.

Over the past year, Circle Surround has been tested and certified for IBOC broadcasting by Ibiquity Digital, and is in regular use by some of the highest-profile terrestrial and digital radio, as well as cable and broadcast television networks in the United States, Japan, China and Europe.

In Japan, terrestrial radio broadcasters such as Tokyo FM, FM Yokohama and J-Wave have all standardized on Circle Surround to deliver their 5.1 surround material.

Given all of these points, I believe an advanced matrix surround system, like Circle Surround, should be seriously considered as the optimal approach to surround sound for digital radio.

Kraemer is chief technical officer of SRS Labs Inc. Radio World welcomes other points of view.

DIGITAL NEWS

WGUC Puts Neural Surround Through Its Paces

CINCINNATI Non-commercial WGUC(FM) in Cincinnati, which has been experimenting with surround sound technologies, has aired a recorded performance of the Cincinnati Symphony Orchestra using Neural Audio technology.

The supplier sought to highlight the station's work. Robert Reams, Neural's co-founder and chief scientist, said this test and others "underscore Neural's commitment to providing the most practical and economical surround solution for HD Radio."

Neural quoted the station's Vice President of Engineering Don Danko saying that after testing the NeuStar 5225 2-Dimensional DownMixer and Neural's Spatial Environment Engine rendering system, the performance of the product "met or exceeded all of our criteria."

"When Neural secures receivers in the market, they will have a compelling surround solution for both traditional FM broadcasting and HD Radio broadcasting," the company quoted him as saying.

Alex Kosiorek, audio recording and mastering engineer of WGUC's Corbett Studio Audio Recording and Production Facility, said he was pleased with the stereo downmix compared to the original stereo mix, noting that with minimal changes, the accuracy of the sound recording was faithfully reproduced.

Danko and Kosiorek visited Neural Audio in Washington state to study the watermarked surround sound system using WGUC and Corbett Studio content.

WGUC is broadcasting an HD Radio signal.

IBOC

▶ Continued from page 14

The first concern I had was reliability. Ibiquity built a lot of safety features into the system. IBOC receivers will handle the digital signal in the primary service area of a station as well as much of its secondary area.

However, if the digital signals become too weak, the receiver will blend-to-analog.

Stull explained that IBOC for AM contains a "layered bit rate," meaning that there is a high-quality digital signal in the primary service area. The receiver will drop to a lesser bit rate where nulls are encountered and the original sidebands when the signal is the weakest.

FM suffers from multi-path signal cancellation that occurs when surrounding terrain and building obstructions reflect the incoming signal into a multitude of incoming paths to the receiver antenna. The multiple signals mix and partially cancel each other because they are not "in- phase," having traveled different length paths. IBOC is more immune to this type of interference, improving the reliability of the signal.

In many ways the IBOC digital receiver responds as current FM receivers do when they mute their stereo-mono blend channels in weak areas rather than produce noise. Keep in mind that IBOC, like any other wireless transmission, is "open circuit"; strong interference will corrupt the radio signal.

Analog FM is not totally free from noise; however noise mitigation in both the AM and FM IBOC systems is achieved at the receiver/decoder. The process of decoding digital modulation from multiple COFDM carriers is more immune to noise than any analog scheme.

Skywave issues

Another question I had was how the AM IBOC signal was going to be handled at night with skywave. In the 1930s the "Class 1s" were established to provide service for major cities and lightly populated centers hundreds of miles beyond their license locale.

Over the years, that service has become less important; and with the addition of new nighttime stations on these frequencies, reliable long-distance listening — DXing —has become more difficult.

IBOC stations will be concentrating on their primary service at night, identified as the Night Interference-Free limit of the station. Ibiquity has performed several tests with adjacent channels transmitting IBOC along with the continuously variable analog skywave signal, which is more powerful than the IBOC skywaves reflected back to earth.

Stull directed me to tests that measured signal strength and interference between WLW and WOR at 700 and 710 kHz; these have been filed with the FCC and reported in Radio World. Recordings of signals have been played for numerous test populations to determine how people respond to the reflected analog and digital signals coming together.

Both WLW and WOR are Class A stations with tall towers and considerable ground-wave coverage. Tests reveal that the analog skywave signal is present and can be heard in the areas where only the skywave signal of both stations can be received. In general, these tests demonstrated that in the fringe groundwave coverage areas of both stations, the first-adjacent analog splatter interference from the other station limited its useful reception as much as the first-adjacent digital sideband interference did.

AM antennas, nighttime signals

The analog sidebands are considerably more powerful than the IBOC signal. Receivers are made with the option of operating in the analog mode with a sharp 5 kHz IF filter to reject the digital subcarriers for better DXing.

Further study is required to see how AM analog and IBOC decoders will handle the cross-mode interference in terms of receiving mixed skywave and groundwave signals.

How antennas of all kinds handle AM IBOC is pretty well known for the transmission end. Minimum bandwidth and group delay specs have been established and can be measured; generally, it's no problem for most non-DA antennas in addition to DAs and multiplexed antennas that can handle AM stereo okay. It's only the very sharp, poorly designed DAs and tightly spaced multi-frequency multiplexed antennas that will not work very well, if at all, with AM IBOC.

It's only the very sharp, poorly designed DAs and tightly spaced multi-frequency multiplexed antennas that will not work very well, if at all, with AM IBOC.

Consider the .625 wavelength towers with their high lobe of radiation that could reflect a signal back down in the primary service area as well as very short antennas, some designed for daytime operation that have been given nighttime authority.

Top-loaded antenna radiation also needs to be studied. All of these radiators have the potential to reflect a nighttime

See IBOC, page 18 ▶

Consumer DRM Units Move Closer

by Lawrie Hallett

Since its official launch in June 2003, Digital Radio Mondiale has made progress moving into the mainstream.

On the broadcasting side, according to the DRM Web site, about 65 leading broadcasters regular deliver DRM output. On the receiver side, until recently, smaller manufacturers such as Mayah and Coding Technologies were making most of the progress.

Now, however, larger chipset and software manufacturers are entering the scene, eager to encourage mainstream receiver manufacturers to add a DRM capability to their designs, according to DRM proponents.

Car radio chipsets

In Germany, Fraunhofer IIS has launched what it describes as the first DRM chip design for car radios. Based on the Philips SAF7730 single-chip, dual-IF car radio and audio DSP, the Fraunhofer IIS DRM implementation is designed to fit into automobiles.

The objective is to allow OEM upgrading of in-car designs to the DRM standard by inserting a DRM module into an existing connector slot. Such an approach allows manufacturers to differentiate products with minimal investment, risk and time to market, note observers.

Fraunhofer IIS expects the next stage will be to develop fully integrated DRM-capable car radio chipsets, lowering the system cost further to meet mass-market requirements.

As previously reported by Radio World, U.K.-based digital radio software specialist RadioScape has reinforced its relationship with U.S.-based microchip manufacturer Texas Instruments and announced plans to develop its first DRM receiver modules.

As with its previous products, RadioScape DRM-capable products will be based on TI DSPs. The modules will incorporate a DRM, DAB (VHF band III and L-band), FM and AM capability on a single chip.

Domestic use

Though the DRM standard has begun to establish itself in the international shortwave broadcasting arena, it has not yet made any real impact on domestic medium- and long-wave broadcasting, DRM experts say.

However, with international broadcasters such as RTL developing wide-ranging plans to implement the technology, chipset manufacturers see potential for good sales volumes.

Because the vast majority of current DRM broadcasting is in the international shortwave bands, it is likely that the first DRM-capable consumer receivers will be "World-Band"-style designs, covering 150 kHz to 30 MHz, most probably with FM as well.

In some markets, notably Europe, Eureka-147 coverage may also be included. The advantage for receiver manufacturers in starting with this sector is that such receivers, while not mass-market designs, do command higher end-user prices.

They are, therefore, a good starting point from which to recover early development costs — inevitable when moving into a new broadcast technology — without ramping up high-volume production lines too soon.

From a longer-term perspective, such an approach has other advantages. Putting limited frequency coverage DRM receivers into the market could cause problems in future if plans to use 26 MHz frequencies to transmit local services take off.

Several governments across Europe are currently looking at the possibility of using such frequencies to supplement the capacity of existing domestic medium-wave allocations.

Though developed after Eureka-147 DAB, DRM is no longer seen as a threat to the "FM replacement." Backers of the technologies are now working together, seeing their respective standards as complementary.

Whereas DAB is said to offer advantages in terms of multimedia capabilities and, potentially at least, audio quality, DRM as an "AM replacement" standard can deliver signals more cost effectively over wide areas, say proponents.

In addition, it is ideal for remote rural areas where terrain may be difficult and where DAB coverage would require multiple transmitters or where there may be insufficient services to fill a complete DAB multiplex.

Chipset design has come a long way since the launch of early consumer DAB receivers in the mid- to late-1990s, and this is perhaps one reason why DRM appears to be moving faster.

If mainstream receiver manufacturers manage to get consumer designs into the shops before year-end, DRM move into the mainstream will be one step nearer, perhaps faster than many might have predicted a few months ago.

Chipset design has come a long way since the launch of early consumer DAB receivers, and this is perhaps one reason DRM appears to be moving into the mainstream faster.

IBOC

▶ Continued from page 17

signal back into the primary service or NIF area. These are serious issues but they can be overcome, according to research in the NAB Engineering Handbook and my talks with RF engineers.

Close-in skywave interference from its own antenna to a station's secondary groundwave reception is a well-known problem in analog, especially on the high end of the AM dial, and will also cause difficulties for AM IBOC; but more study is indeed needed on this.

Class B regional stations may require antenna redesigns and power adjustments to continue effective operation, more because of population shifts than anything else. Many of these stations were designed to serve a specific geographic area four or five decades ago. This is a problem with analog transmission, no matter what happens with AM IBOC.

Since then, "suburbia" may have moved the majority of listeners away from the NIF. Redesigning an AM analog or digital antenna is neither easy nor cheap, but as the new age of broadcasting comes along, it is something station owners need to consider.

Improved audio quality and the reduction of noise will be the greatest change the AM listener will experience. The new sound will probably bring music back to that band.

The casual FM listener using a monophonic clock radio will not hear much of a difference. Bad multipath also spoils analog FM reception on small radios, especially in hilly and mountainous areas. Larger systems with quality speakers will exhibit the loss of multipath background noise, generating greater dynamic range and the possibility of "surround sound."

What listeners of both bands will be able to experience is the addition of voice and data channels that IBOC will be able to convey. Consider an IBOC receiver with a small memory chip being able to store and play back the latest traffic report or headlines, or the ability to display information — far beyond the RDS feature available on analog FM.

Timeframe

The next consideration is the timeline to implement this system. If the IBOC plan is adopted by the FCC shortly, Ibiquity projects the time for it to become a primary medium in cars is 10 to 12 years, based on auto industry statistics for how long the average owner keeps a car.

Right now, most research has been done in designing car radios. Next come home receivers and tuners. Work still has to be done to downsize the electronics to fit in a Sony Discman. However, that will happen.

This sounds like a long time in an age when most people want immediate change; but consider how long it took for other new forms of broadcasting media to "catch on." NTSC color televisions went on sale at the end of 1953, but color television did not become a primary viewing medium in the United States until 1968

See IBOC, page 20 ▶

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IBOC

▶ Continued from page 18

— 15 years. FM stereo, an in-band, on-channel signal of its age, was approved in 1960 yet few broadcasters took an interest in it until almost a decade later.

Example: "FM Listener's Guide" from August 1962 listed 24 FM stations in the New York City edition. Three were broadcasting in stereo. An article in that issue reported that many listeners buying Dynaco tuner kits making their stereo receivers. "FM Listener's Guide" reported that the last five months of 1962 would see the addition of 200 FM stations adding stereo broadcasting in the United States.

Some FM stations were still broadcasting monophonic signals well into the 1970s. The conversion was often an expensive endeavor with new consoles and stereo generators either made or purchased in the beginning. Some broadcasters had to replace old narrow-bandwidth antennas with new ones that could accommodate the stereo multiplex channel. New towers or transmitter locations were obtained to improve coverage.

In many ways the conversion of FM to FM stereo over 40 years ago set the stage for FM IBOC. Nearly all of the present FM transmitters and antennas will be able to handle the new IBOC signal.

I had my doubts about how this system would work for listeners. Anyone with a digital telephone knows what happens when they try enter a 'dark' reception area; the signal mutes.

AM is another story. It is in a condition similar to where FM was in 1960. A brief historical review reveals that by the mid-1950s no one was making FM transmitters, and only Zenith was making receivers. Only a few dedicated listeners tuned in the band, which consisted of classical music, talk and ethnic programming or a duplication of what was already on AM.

AM will need revitalization similar to what FM experienced four decades ago. AM tube transmitters will need to be replaced. Some antennas probably will need rebuilding. Ground systems in many facilities have been allowed to deteriorate and will need to be replaced. This can be costly; but consider the investment many broadcasters made in FM in the 1960s. Years went by with no return, but when technology caught up with the medium in the 1970s there was a windfall of profit.

What happened with FM in the 1960s could happen again with IBOC AM and FM in the 21st century. It may generate buyouts resulting in improved signal coverage in communities.

The delay

The IBOC signal, compressed as it is, requires extensive processing at both the transmitting and receiving sides, leading to about an 8-second delay of audio.

Analog audio is delayed to be synced with digital audio. This delay will create new issues with broadcasting.

Reporters will no longer be able to listen to their stations for cues. Using a telephone as an IFB could solve that problem.

Then there is the issue of listeners at an athletic event. The 8-second delay could nix taking the radio to the game. However the broadcaster has an option for these situations; carrier-current transmitters could be installed in the stadium transmitting in real-time. There is also the option of shutting off the IBOC transmission for athletic events or during emergencies when real-time broadcasting would be essential.

Program directors who want DJs to hear the "air sound" of the audio will have to have undelayed audio sent back to the studio after it is processed, but before it is sent to the transmitter or feeding headphones off of an in-studio processor emulating the on-air signal.

IBOC offers broadcasters the option of moving into the next century on their present frequency. It can increase the interest in local radio with additional channels of audio and data.

Digital radio is here, delivered via satellite. If terrestrial broadcasters don't update their signal transmission, satellite broadcasters will continue to lobby for more service and win over new converts and subscribers. If change doesn't take place I foresee free satellite broadcasting with radios coded to receive news, traffic and commercials for their location determined by a built-in GPS module.

Traditional radio broadcasting needs the technological edge to compete and IBOC seems to be an answer.

Within the confines of working within present AM and FM frequencies, Ibiquity's IBOC approach looks like a reliable system. I feel cautiously optimistic it will improve sound quality, reduce noise and offer the option of additional services radio stations can provide to their communities.

The author is in his 14th year as laboratory director for video technology and communications at the Thomas Jefferson High School for Science and Technology in Fairfax County, Va.

RW welcomes other points of view.

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NAB2005 Photo Gallery

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Distinguished Service Award Presentation to Lowry Mays. From left: NAB Joint Board Chairman and Citadel Communications Philip J. Lombardo; Lowry Mays of Clear Channel; NAB President/CEO Eddie Fritts.

Photo by Paul McLane

Ben Barber of Inovonics talks to visitors about processing for digital radio.

Photo copyright NAB

Charlie Rich Jr. performs at an Orban party.

Photo by Paul McLane

'Everyone's asking for IP,' said Tieline's John Gouteff, here with the company's Jim Godfrey and the Commander G3. IP functionality appears on numerous new broadcast products.

Photo copyright NAB

David Frerichs, Robert Reams, Alan Kramer and Frank Foti participated in a session about approaches to surround sound.

Photo by Paul McLane

Portable recording devices attracted attention, here for Marantz, which showed the PMD660 Portable Solid-State Recorder to broadcasters for the first time.

Photo by Paul McLane

Broadcast Electronics reps gather in its booth prior to the show to learn about the company's data product line, resulting from BE's acquisition of The Radio Experience

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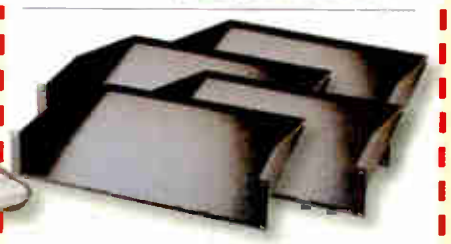

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FIRST PERSON

Big-Market Radio, 39 Years Ago

by Doug Fearn

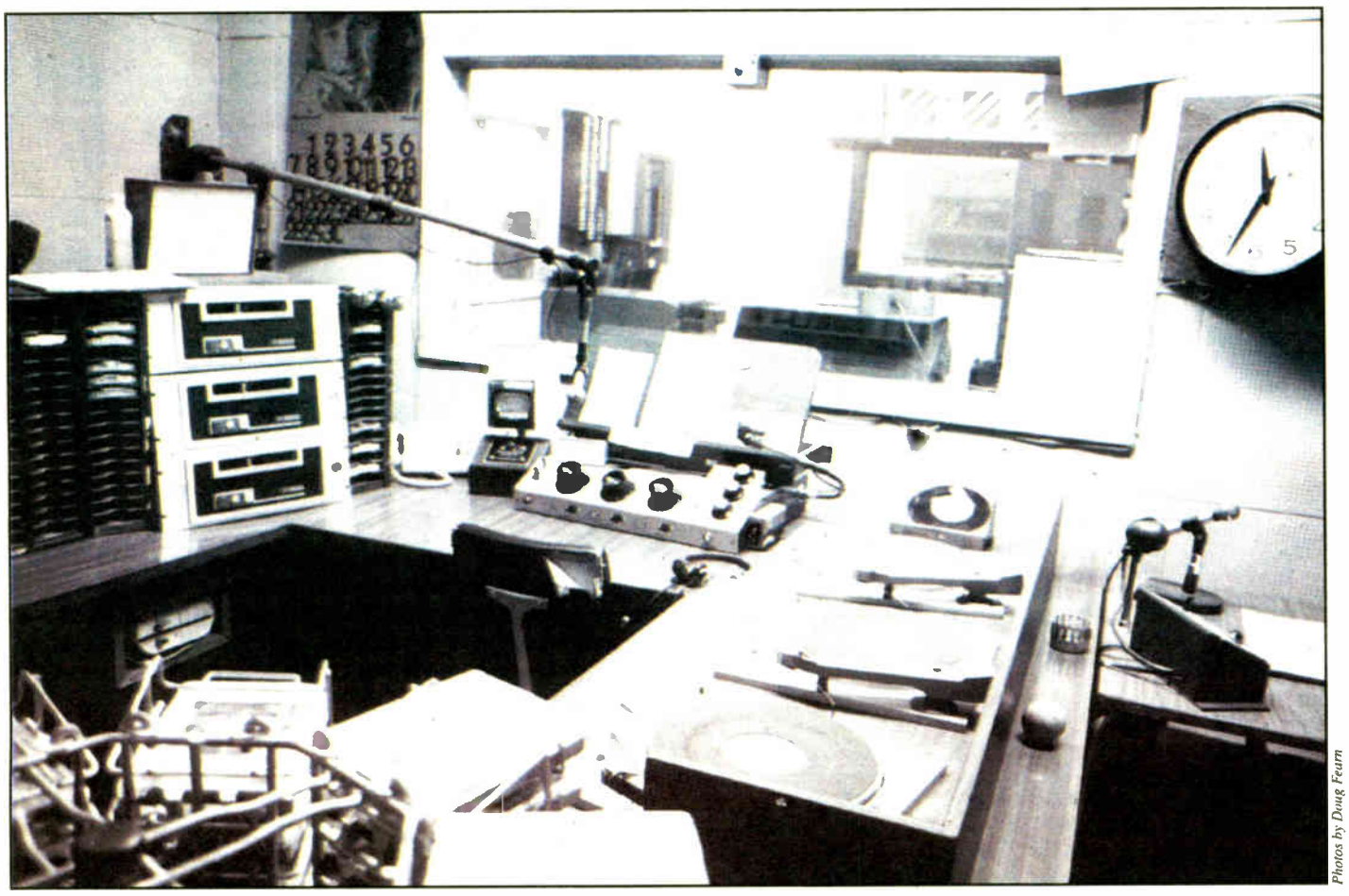
In the April 27 issue, the author wrote about his impressions of WPEN(AM) in Philadelphia in 1966, where he joined the engineering staff at age 17. He continues his station tour here.

In back of MCR was a small hallway, which led to a closet at the end filled top to bottom with spare tubes. Tube failures were very rare, however. Also on that hallway was the entrance to Control Room DE, which faced two medium-sized studios. It had not been upgraded much since the station was built except for the addition of cart machines.

Studio D and Studio E were never used on-air while I was there. One became the newsroom production room, with banks of Ampex 601 tape machines. The other studio was turned into a temporary office for the program director.

If you think this facility is starting to sound like a maze of hallways, you're right. Off the small hall in back of MCR was another hallway that led to the doors for studios D and E, and into the newsroom complex. The main newsroom was a large area with several positions, each with a telephone and a manual typewriter. The wire service Teletype machines were in another room. They clattered day and night, consuming huge boxes of cheap yellowish paper. The room was always hot and smelled of paper and hot oil. The Teletype machines required copious amounts of oil,

See WPEN, page 25 ▶



Photos by Doug Fearn

WPEN Studio B was used for most programming during the day. This photo is from 1972 after the air talent obtained the right to play their own records. The engineer controlled levels and played commercials or other audio sources. Cart machines were for jingles. The mini-console for the turntables is a passive mixer built by the engineering staff. The window looks into MCR.

WPEN Studio F production room ca. 1971. Along the wall to the left were a Crown tape machine that could accommodate 14-inch reels for FM music, and a Scully 280 tape machine, the first solid-state equipment in the building. The counter in the back has an Ampex 350. There had been a disc-cutting lathe to its left, but it was disposed of by this time. Not visible in the racks (behind the cart machines) were a patch panel and several Pultec equalizers. The turntables are the original Fairchild 16-inch, but with more modern tone arms.

Directly in front of the MCR console was Studio B, the main on-air studio for most of the day. It was a large room, even after a portion of it had been divided off to form a jock lounge. Studio B had a Hammond organ and a grand piano, but only the piano remained when I arrived.

The air talent sat at a large U-shaped table with virtually no equipment except for a multi-line telephone with a Bell Speakerphone, three microphones, a key switch to control the main mic and a talk-back button. The mic was an RCA 44BX, but soon after I arrived it was replaced with the then-new model EV 635A. The mic was held by a huge boom stand about 10 feet long, with a counterweight about the size of a small monitor speaker.

Studio B sounded very nice, which was good because the evening air talent was a former country and western singer who usually played his guitar and sang several times through his show.

The smell of news

If the engineer in MCR turned to the right, he looked into the news booth. It was a comparatively small studio, with a table, 635A microphone, headphones and a box with switches for the mic key and talkback button, and a big red jeweled "on-air" light. This studio also had a large cabinet filled with Major sound effects records, hundreds of them. They were seldom used anymore, but I later learned to appreciate their unique qualities.

WPEN

▶ Continued from page 24

and it dripped out of them constantly.

Back out on the main hallway was the entrance to the Music Library, a huge room with floor to ceiling shelves for tens of thousands of old 78s and newer 33-1/3 RPM albums. The top shelves had to be accessed by a sliding ladder. In the middle was a desk with an over-sized manual typewriter where the music director compiled every show and typed the playlist.

Production

Heading down the hall, there was a small studio with an old RCA OP7 remote amplifier for doing newscasts on the FM station. The far end of this hall led to Control Room and Studio F, which was the main production facility.

This control room had the most sophisticated equipment in the building, including a newer RCA console, three cart machines (one for recording), two Ampex 350s, a Crown tape machine that took 14-inch reels, Pultec equalizers and my personal favorite, a disc lathe with its huge rack-mounted amplifier with four 811As and mercury vapor rectifiers.

Sadly, Studio F was small and sounded boxy if more than one mic was on.

The jock lounge and an engineering office rounded out the third-floor facilities.

The owners of the station at the time made their money with a chain of drug stores, and the design of the building front reflected that. In addition to a vertical electric sign that said "WPEN' there was a multi-colored neon sign that said "Station of the Stars" in script.

The fabulous Studio A was on the first floor. It seated hundreds at small, round tables and bench seats along the walls. The control room for Studio A was elevated and accessed by a set of metal stairs. Inside, a small area had been partitioned off with a window to allow a newsman to read the news. Otherwise, all three sides of the control room were glass, affording a panoramic view of the studio.

At the far end of the studio, a raised platform held a custom-built desk with several guest positions. The room sounded great, with its huge size, but the audio was degraded somewhat by the PA speakers in the ceiling.

The wire service Teletype machines were in another room. They clattered day and night, consuming huge boxes of cheap yellowish paper. The room was always hot and smelled of paper and hot oil.

On my own

After about a half hour on my first day, Charlie Fritz stood up and said he was going to lunch and I would take over.

I felt a combination of elation and trepidation as I sat down and surveyed the equipment around me. The song ended, the air personality turned on his mic and I potted down the turntable. The log said there would be two carted commercials, which I played on cue, and then I was instructed over the talkback to segue into the next record, with a voice-over introduction.

It felt weird with the turntables on the right, and even stranger to use the key switch when the time came to release the disc, but everything went well. I had a constant fear that I wasn't ready for the next event, but somehow I managed to get each element on the air as needed.

The six o'clock hour had a full 30 minutes of news, first from NBC, then local, then more NBC, and finally Mutual. I found out how awkward it was to cue up a tape by remote control when the 7-inch reel was only a tenth full, and I learned how to segue from one network to the other by rapidly turning two rotary switches in opposite directions. Finally the news marathon ended and the next program was a religious rant on tape. That half-hour gave me a chance to clean up the piles of carts, records and tapes that had accumulated in sloppy piles around the room.

Later that evening Charlie showed me the Studio A control room and explained how that show went. I stood behind him for the talk show, as he switched to tape delay for phone calls, adjusted the various mic levels for the guests on the show (who invariably had bad mic technique), quickly worked the phone fader to avoid the pops and clicks of the crude key set and speakerphone, and aired the newsman's mic for the late newscast.

Payday

Station employees were paid in cash on Friday. The lobby had a small bank-teller style window with bars, and each employee would step up and receive an envelope with their pay. Soon after I started working, the system was converted to pay checks.

And so it went. I worked weekends for the rest of the school year, dragging myself into class Monday at 8 in the morning after getting home at 3 a.m.

Doug Fearn will look back at the transmitter side of 1960s WPEN in a future article.

The author is the owner of D.W. Fearn, a pro audio equipment manufacturer; he was chief engineer and operations manager of WKSZ(FM) in Philadelphia for a decade.

NAB2005 Photo Gallery

NAB2005

- **Photo Album**
- Engineering
- Management
- Sales
- Programming

Photo by Bob Kovacs

Dale Rood of Four Directions Productions gets a presentation on the Audio-Technica AT2020 condenser mic from Steve Savanyu.

Photo by Paul McLane

Products to support an HD Radio infrastructure are proliferating. David Day of DaySequerra and Jim Haupstueck of Harris said interest was strong in the DaySequerra HD Broadcast tuners, seen in the upper half of the rack behind them.

Photo by Paul McLane

Prepping the Klotz booth.

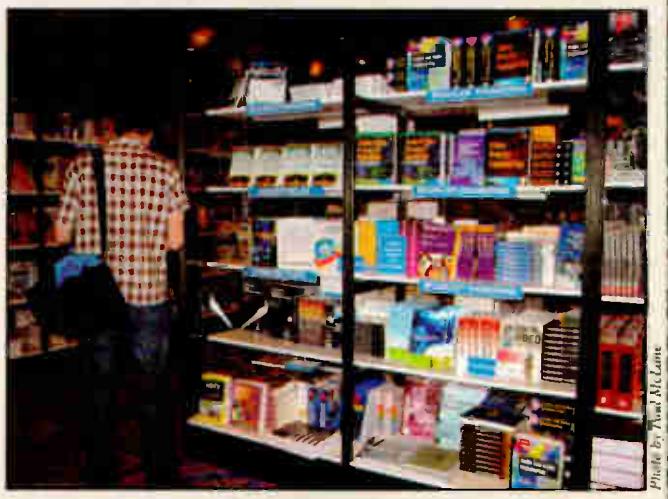


Photo by Paul McLane

Shopping in the NAB Store. The association announced a new edition of the book 'A Broadcast Engineering Tutorial for Non-Engineers,' which it promotes as 'a must-have for anyone that has any contact with the field of broadcast engineering.'

Photo by Paul McLane

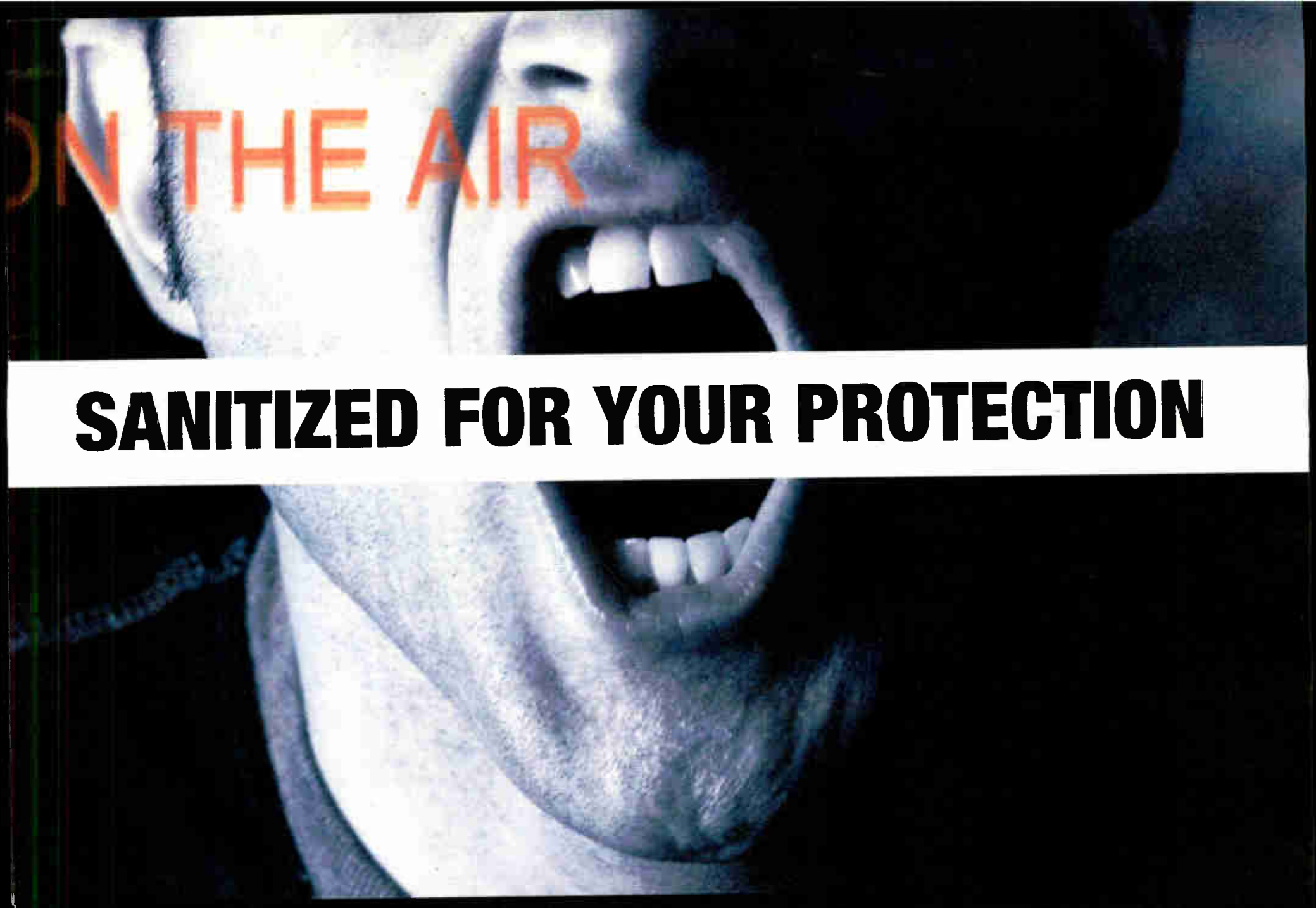
Attendees could use a new monorail to access some hotels and the Strip from the convention center.

Photo by Paul McLane

Continental Electronics executives Dan Dickey and John Uvodich pose with the 816HD transmitter for FM IBOC at power levels of 10 to 50 kW. The company became an Ibiquity HD Radio licensee in February.

Photo by Paul McLane

Walking the floor of the North Hall. Traffic was brisk, and radio exhibitors generally reported a stronger business environment for the year to date than last year.



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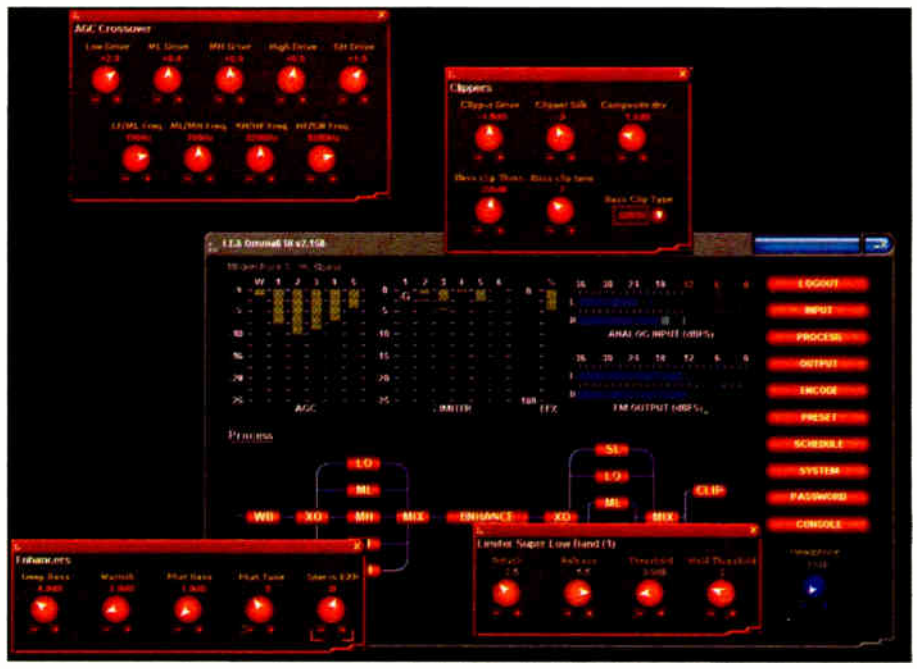
Great Ideas in Radio Station Software

by Tom Vernon

Since the earliest days of radio, a creative spirit has been a part of the broadcast engineering tradition. In the beginning, engineers built their own equipment because there were no commercially manufactured products. The tradition continued, and in later years it wasn't unusual to see stations with much of the equipment built on site.

Today's consolidated radio landscape is a different environment from that of years past. But while opportunities to scratch build audio and RF gear are few, the creative spirit lives on, often in the form of homebrew software engineering projects. Engineers are crafting their own software to fill unique needs, perhaps because off-the-shelf solutions are too expensive, or simply for the fun of it.

Let's look over the shoulders of a few people who have been busy writing their own code.

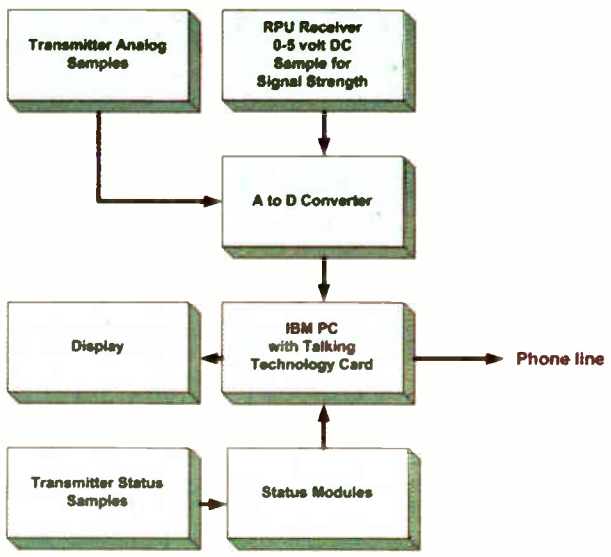


Cédric Maufroy of L.E.A. in France created a centralized management tool to handle control of their network of processors via a Virtual Private Network.

VB at 'BZ

Mark Manuelian, engineering manager at WBZ in Boston, used his Visual Basic programming skills to save his station the cost of purchasing commercial software. Over time his program evolved to fill several needs.

The sales staff needed access to the station's commercial library in order to provide clients with spec spots and commercial copy, he said. Manuelian sought to enhance the shared production software of the automation system and to add the ability to e-mail audio files to clients.



Paul Shulins created this talking receiver-strength device to help with aligning RPU shots.

Manuelian wrote a player in VB which met the requirements of the WBZ sales department. Later the software was modified to streamline newsroom operations.

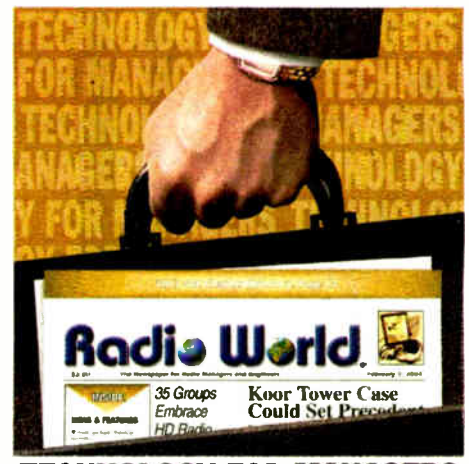
He also wanted to speed up the playlist editor and create an effective way of checking the selected cuts. The first major revision of his player was to add a playlist editor that was compatible with the on-air system.

At last summer's Democratic National Convention, the news department needed an easy screen for on-air playback of news cuts. The player program was again revised to include an "on air" playback screen and some library database maintenance routines.

"Today the program is installed on more than 50 computers and used regularly by news writers, editors, the production department, sales staff and program department managers." He said, "Purchasing existing software would have cost at least $30,000, and would not have had all the needed functionality."

Radio's transition to the digital age has brought with it special challenges

See SOFTWARE, page 29 ▶



The Right Tool For the Job

Engineers can use a variety of programming languages to create applications. Which is st depends on several factors, including the operating system the application will run under, the size of the application, the skill of the programmer and the need for speed.

C++ is a flexible, efficient and powerful language. It has been used for commercial software development for about 15 years, and is supported by a wealth of editors and debuggers. It is an object-oriented language that requires the programmer to know a bit about the workings of microprocessors.

C++ is more difficult to learn that some languages; and with flexibility and power comes the potential to create programs with subtle bugs that can be difficult to locate and repair. Memory leaks and overwrites are common problems for novice programmers.

Java was introduced around 1996 by Sun Microsystems. It is based on C++, but simplified. The developers of Java left out the capabilities of C++ that got programmers into trouble. Java produces an intermediate form called byte- code, which runs on a platform-specific Java Virtual Machine, or JVM. This means programmers can write code once and use it on several platforms, such as Macintosh, UNIX or Windows, saving development time.

Programming in Java is similar to programming in C++, involving the development of objects. Developers can create either standalone applications or applets, which run within a Web browser.

Visual Basic is now part of Microsoft's.NET development environment, which includes VB, C#, J# and C++. VB is probably the easiest language to learn; a beginner can be creating simple Windows applications in short order. A novice programmer can get a long ways in VB by dragging list boxes and buttons onto an interface and writing minimal code. A wealth of third-party ActiveX libraries makes it easy to add complex functionality to home-grown applications quickly. Of particular interest to radio developers are SwiftSoft's libraries of ActiveX components for streaming audio and multimedia.

Because VB is simplified, users don't learn many of the complexities of programming such as memory management, requiring additional study if they decide to move up. Visual Basic code tends to be larger and less efficient than that of other languages, making large programs run slower and take more space in memory. Another limitation is that VB can only be used for Windows and Web-based applications, making it unsuitable for cross-platform development.

Python is an interpreted, interactive, object-oriented programming language often compared to Java. In addition to program development, it can be used as an extension language for applications that need a programming interface.

Python applications are portable, running on Windows, UNIX, MacOS and other platforms. The Python language is copyrighted, but freely usable and distributable, even for commercial use. Free downloads are available at *www.python.org*.

Software

▶ Continued from page 28

for visually-impaired operators. Ruth Phinney, program director for WXXI Reachout Radio in Rochester, N.Y., supervised the transition of the radio reading service from an analog to a digital infrastructure that uses ENCO's DAD software.

"Being a very graphically-based software, DAD has presented some unbelievable challenges," she said. ENCO's Gene Novacek developed a short program which would enable DAD to interface with Window-Eyes, a screen reading application for visually-impaired computer users.

Since the system had to work in a live studio, feeding the output of Window-Eyes to a speech synthesizer was not practical. Instead the screen reader interfaced with Freedom Scientific's Power Braille 40, a $4,500 device that presents screen data as 6-dot or 8-dot refreshable Braille.

A PBB-24 Programmable Button Box from Broadcast Tools is used to change between selections within ENCO quickly. A series of keyboard shortcuts for DAD was devised, eliminating the need for a mouse.

Phinney said maintaining the interface software is an ongoing challenge, as it needs to be revised each time a new version of DAD is released.

Most of Reachout Radio's board operators are sighted and must use DAD in the conventional way. During those times, the Window-Eyes interface simply is turned off.

One man, one voice

Aligning a RPU yagi antenna from a remote site is usually a two-man job, with one engineer at the receiver relaying the signal strength back to the other, who is at the remote site aiming the transmitting antenna.

Paul Shulins, director of technical operations for Greater Media in Boston, figured out an easier way. Station personnel can dial a number on their cell phone, make a couple of quick menu selections with the keypad and hear a voice speaking the receiver signal strength, making antenna alignment a one-man job.

The 0-5 volt signal strength sample from the RPU receiver was connected to an analog-to-digital converter and scaled so 5 volts corresponded to 100 percent.

Shulins added a telephony card manufactured by Talking Technology to a PC, recorded a female voice speaking the numbers 1 to 100, corresponding to receiver signal strength, and stored them as audio files on the PC's hard drive. Next he wrote a simple program in Basic that sends an audio file corresponding to signal strength to the Talking Technology board. The signal strength reading is updated about once per second.

"It would have been possible to do this with voice synthesis," he said, "but the quality of a recorded voice, especially with numbers, is much better."

The cost for such a project is surprisingly modest.

"Any 386 machine running DOS with a 20 MB hard drive is fine," Shulins said. "The PC card from Talking Technology costs between $200 and $300."

This application is a small part of the telephone interface Shulins has developed for the five Greater Media Stations in Boston. Around 700 status items can be accessed via telephone, and users can also control the routing switcher to assign an audio feed to a subcarrier generator for use at remote sites.

Custom control

Managing a radio network with hundreds of transmitter sites practically begs for custom solutions. Cédric Maufroy, general director of L.E.A. in Le Bourget, France, has the job of maintaining the network's Omnia audio processors. Doing the job by hand was costly in engineering resources.

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WXXI Reachout Radio uses a program by ENCO that enables the DAD system to interface with a screen reading application for visually-impaired users. Here, Andy Shields uses the new setup.

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

It's Radio, Jim, But Not as We Know It

The Divergent Paths Open to Broadcasters Could Make the Future a Very Different Place

It's an exciting time for radio, with lots of activity in many different directions. The celebrated cover story of a recent edition of Wired magazine cited "The End of Radio (As We Know It)," presenting numerous new formats as potential successors.

As in other transitions, there seems to be two schools of thought to radio's evolution: incremental and disruptive. The transition to HD-Radio — and for the most part, to satellite radio as well — seem to represent the incremental approach, while the disruptive element includes all of the truly new delivery forms, generally characterized of late under the "podcasting" label, but extending beyond this, especially as time goes on.

What is often lost in these binary comparisons is the point that both models can and often do coexist in such evolutions. Eventually one form may dominate, but this may take a long time, particularly when the installed legacy base is as substantial as AM/FM radio's. The most likely scenario in the near- to mid-term, therefore, is a straddling of the fence by broadcasters, so broadcasters need to keep a foot in both camps.

Diversity or dilution?

That may be easier said than done, however. Consider that while it's expected that emerging platforms will be quite volatile in their early days, requiring frequent recalibration of their worth, radio's legacy environment is *also* experiencing substantial incremental transition at the same time.

So today, broadcasters are faced with the challenge of managing both incremental and disruptive change simultaneously. Given funding constraints placed on all technological ventures, there is serious risk of either spreading one's investments too thin by so broadly hedging bets, or missing the boat by focusing strongly on what turns out to be the wrong direction.

Broadcasters today are faced with managing both incremental and disruptive change simultaneously.

Nevertheless, the roster of items to watch continues to expand. On the legacy side, broadcasters face the IBOC transition in the United States, and the DAB transition elsewhere. The latter is experiencing a second wave with updates to the format now being finalized, and a compatible extension called Digital Multimedia Broadcasting (DMB) coming online in some regions. Meanwhile, the DVB-H and DRM formats slowly are moving forward in both domestic and international environs, as well.

All of these designs start from a base of existing broadcast facilities and operators, be they AM/MW/SW, FM or TV, with an eye toward moving these incumbents into their next generation.

Stretching legacy's legs

Yet a point often lost when evaluating these options is that if such formats are intended as legacy extenders, just how much extension can they provide? We're already seeing how the Eureka 147 DAB and DVB-T formats allowed backward-compatible extensibility to accommodate DMB and DVB-H respectively (along with other incremental additions to DAB for electronic program guides, enhanced error correction for advanced codecs and datacasting, subscription radio and more). Will HD Radio have similar extensibility, or is it a one-trick pony? Any new format must be examined not just for what it can do today, but how it will fare over the long term.

HD Radio's primary extensibility feature is its ability to move from hybrid analog-digital to all-digital mode, which is valuable from a long-term transitional perspective, but also intrinsically involves the ultimate loss of backward compatibility. It is hard to imagine FM analog (or

See FUTURE, page 31 ▶

Future

▶ Continued from page 30

even complete AM analog) broadcasting's shutdown, so the value of such extensibility is somewhat dubious. Nevertheless, its ability to be done on an individualized basis by each station on its own schedule — and the inclusion of an interim Extended Hybrid mode for FM — provide good potential flexibility for the industry.

An unanswered question in this area involves how any *other* HD Radio extensibility issues will be managed, however, given the unique single-vendor control that Ibiquity Digital wields on the format. Will the NRSC continue to be a venue for such updates, as the WorldDAB Forum has done for Eu-147/DAB (taking over management of the format from its original developer, the Eureka Consortium)? And what if other countries besides the U.S. adopt HD Radio, as recent Ibiquity action at the ITU seems to portend? Will the format retain uniformity or compatibility with U.S. HD-Radio receivers?

Finally, the largest open issue in the legacy world is what will happen in the datacasting space. Will HD Radio datacasting be just another lukewarm success like RBDS, or a largely unfulfilled promise, like SCA data? Or will it open wide new service and revenue opportunities to broadcasters, perhaps even serving as a bridge to new media delivery (e.g., audio file downloads via "tricklecast")?

Jumping the fence

Then there's the other side of the equation, where wholly new forms of content distribution are emerging, as we've discussed in several recent columns. The good news here is that broadcasters don't have to develop and maintain the delivery pipelines, but the bad news is that they don't control those pipes, either.

This can be a workable tradeoff, however, especially given broadcasters' continued retention of their exclusive rights to scarce legacy channels all the while. Broadcasters may not own and operate the new media delivery systems, but they can pretty well manage their audiences' transition to it via careful cross-promotional and service-package differentiation efforts.

It's important to grasp how formidable this onslaught of new offerings vying for listeners' attention may be. What we've already seen — from iTunes to podcasting — is likely just the tip of the iceberg, with a wide range of brand-new offerings taking shape just beyond the public horizon at present. These next-gen service launches will likely proliferate with numbing frequency over the next year or so, creating a bubble that will eventually burst, or at least shrink, in the years beyond. Where radio will take its eventual place in the consumer preference map after this cycle settles is a key consideration, and one which several leading-edge broadcasters are already taking steps to optimize.

Perhaps most interesting to contemplate today is the form that some new end-user devices will take. There is much discussion at present on the "converged receiver," most likely a wireless phone + digital radio. This is a rich target that broadcasters could address from both service directions. More on such a world next time.

Skip Pizzi is contributing editor of Radio World.

Software

▶ Continued from page 29

Maufroy and his team created a centralized management tool to handle a number of tasks related to their processors, which are connected to L.E.A.'s headquarters via a Virtual Private Network, or VPN.

They wrote a common software API (Application Programming Interface) so the application would interact with different types of processors. Currently the software works with Omnia3, Omnia3 Turbo, Omnia4, Omnia5 and Omnia6 devices. The API was written in C/C++ with Microsoft Visual Studio.net.

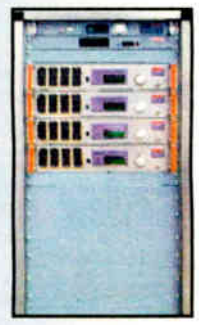
Maufroy's control software is delivered on a key USB, usable directly without installation on the computer. No data remains on the computer once the key USB is removed, protecting the software from illegal copies and unauthorized access to the system.

An administration tool can authorize or prohibit access to each parameter of the processor for each USB key. User profiles create a screen interface specific to each type of user, from beginning to expert. The change of interface is dynamic at the moment of user logon. The remote control software is written in C++.

Maufroy developed a high-level GUI for management of the processor database, as well as the server for automation of audio processor update tasks. This tool was developed in Pascal with Delphi 7 Enterprise. Using it the engineer can index transmitter sites and information about processors on the network; create and schedule tasks for a group of processors, for example, updating preset content for a subset of processors at 3 a.m.; create and store L.E.A.-designed presets; create logsheets of actions that succeeded and failed and synchronization of the database with the processors already installed.

Maufroy's software also allows remote audio monitoring of sites via tuners located at the transmitter sites, enabling quality checks and remote diagnosis of audio problems.

Tell us about your custom solutions. Send a letter to the editor at radioworld@imaspub.com.



USER REPORT

WFCR Gears Up for IBOC With Z6HDs

Harris' Solid-State Z6HDs Features a Dexstar Exciter for RF Functionality, HD Radio

by Charles Dube
Chief Engineer
WFCR(FM)

AMHERST, Mass. Terrestrial radio is entering a period of renewal with the excitement generated by HD Radio. Not only does HD Radio offer the potential for vast improvements in audio quality, it introduces a new business model through multicast audio and supplementary data services. National Public Radio's Tomorrow Radio Project, currently in the midst of a multi-year testing phase, continues to be a driving force in educating the radio industry on HD Radio's many benefits.

WFCR(FM) is an NPR affiliate in Amherst, Mass. WFCR was fortunate enough to receive a Corporation of Public Broadcasting grant in the first round of HD Radio purchasing for NPR stations in late 2003. The station has been broadcasting an HD Radio signal since November 2004 using a **Harris** Z6HDs solid-state transmitter operating at 1100 watts TPO.

As reported in the Jan.19 issue, WFCR supporters Joseph and Dorothy Gavin throw the switch on the station's digital transmitter.

Z-Plane, Z-Plane

There were few HD Radio transmitters available at the time of WFCR's purchase. But of the vendors who did have products, Harris responded enthusiastically regarding its HD Radio-related equipment. My experience with Harris transmitters at other stations, notably its FM 7.5K and SX Series models, reinforced my confidence in Harris to deliver a high-quality HD Radio transmitter.

The Z6HDs fits neatly into our existing transmitter facility five-and-one-half miles from the WFCR studios. Outdoor preparations were few as the transmitter was configured into a high-level combining scheme with an existing analog FM transmitter.

Indoor preparations consisted of relocating existing storage cabinetry, and a thorough evaluation of our air conditioning unit and electrical capacity. The current AC unit was installed in 1997 and oversized to meet University of Massachusetts specifications, which worked to our advantage upon installation.

Redundancy is the most immediate benefit of the Z6HDs. Its design features a dual power supply and module system that virtually eliminates failures that shut down the transmitter. The Harris Dexstar HD Radio exciter and IP1D Pre-corrector have dual-unit options allowing for further redundancy, although WFCR stayed with the single-unit configuration for the time being.

The modular design of the Z6HDs transmitter allows for hot-pluggable servicing in the event of a PA or IPA module's failure. The IPA and PA modules are of the same design and are interchangeable. Only one side of the module is employed in the IPA stages, while the other half serves as standby in case of failure.

Module outputs used in the PA are isolated from each other by means of Harris' Z-Plane combining method. Loss of any one amplifier will not upset the Z-Plane impedance, nor will it affect the output of the other modules. Each module continues to see a 50-ohm load even if other modules are removed for service. This "soft" failure feature allows the transmitter to remain on the air, albeit at a reduced power level.

A useful comparison of solid-state redundancy to tube-based performance can be demonstrated within WFCR's transmitter facility. For instance, a component failure in the PA section of another manufacturer's FM transmitter takes the unit completely off the air, a situation germane to any single-tube transmitter. The Z6HDs uses hot-swappable modules that can be replaced while the transmitter is operational.

There also is little danger of installing the modules incorrectly, as they are designed to be inserted either side up.

Maintenance is simplified with solid-state technology. Measurements at WFCR are taken on a weekly to bi-weekly basis — by choice to spot trends — and compared to older logs and service manual specifications.

Keeping the transmitter clean generally ensures that the transmitter is in top operating shape. Occasional air filter cleaning and a regular peek inside the transmitter are the basic maintenance requirements. Modules may be visually inspected without having to power down the transmitter.

Front panel diagnostics allow us to keep up with the transmitter's health status. The Z6HDs offers a significant amount of status readings on two levels. Transmitter power output in watts or percentage, reflected power, PA current and voltage as well as APC voltage readings are found at the basic diagnostic level. These readings reflect the overall general operation of the transmitter.

A menu-driven diagnostics package provides more in-depth readings related to power supply, PA, IPA and power supply temperature, current and voltage. PA isolation resistor temperatures along with the airflow through the transmitter also

See HARRIS, page 40 ▶

FM HD Radio Combiner Guide

FM HD Radio implementation has become a lot like that popular game show in which hopeful contestants must choose one of the doors.

Behind door number one is common amplification (also known as low-level combined), a proven implementation plan for lower powered stations but not a practical option for high powered FMs.

Behind door number two is separate antennas, which will fit the bill for some Class B and Class C stations but only if they have antenna infrastructure to spare. This methodology may include an entirely separate antenna, interleaved bays, or antennas that are dual fed.

Behind door number three is high level combining, a prevalent option for powerhouses that lack the wherewithal for a separate HD Radio antenna. There's also door number four, a back door approach to high level combining known as mid level combining. This is yet another possibility for a few Class B or C stations that have late model transmitters not able to high level combine HD Radio and FM.

So, contestant, which one of these doors is the right one for your station(s)?

Determining how and where to introduce HD Radio in the transmission chain is an important first step. There's simply no way around it. You will have to crack open one of these doors in order to take part in all the new opportunities opening up as a result of HD Radio.

The key is to choose the most cost-effective, operationally efficient system that will give you a reliable foothold on HD Radio now, plus unlock all that the future has to offer, such as Tomorrow Radio™ and text data functions.

We suggest you start with the basic considerations:

1. operating power
2. availability of tower and transmitter space
3. cooling capacity
4. desired redundancy
5. implementation cost
6. operating costs
7. existing equipment compatibility with HD Radio
8. system complexity
9. whether to upgrade a single station or a cluster of stations

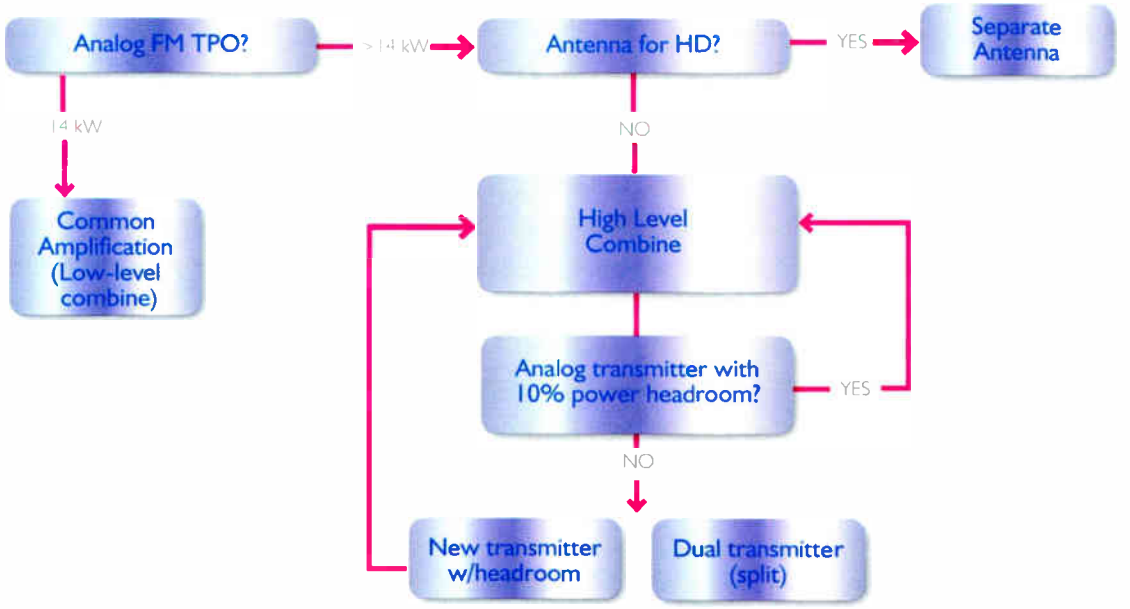
It doesn't hurt to add flexibility into the equation:

10. readiness for Secondary Program Services (Tomorrow Radio)
11. readiness for HD Radio text, Ethernet connectivity from the studio

Then, review what you know about combiner methods ... and bone up on what you might not know about those methods. What follows is a closer look at what's behind each door.

FM HD Radio Implementation Decision Tree

Go to www.bdcast.com/HDRadio and click on "HD Radio Power Calculator" to determine power requirements



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Low-Level Combined

Common amplification. HD Radio is combined with FM analog in the exciter for common amplification through one transmitter and one antenna in a low level common amplification configuration.

Consider low level common amplification if:

- Have less than 14 kW TPO analog FM (transmitter costs increase with power)
- Existing transmitter does not have the additional 10% power headroom needed to cover the combiner losses of high level combining
- Plan to purchase a new transmitter for analog FM anyway
- Do not have the site space for an additional transmitter

What you'll keep

- Existing antenna

What you'll need

- One FXi 60/250 BE exciter for dual HD Radio and FM operation, a BE XPi 10 for signal generation at the studio or the transmitter site, and a solid-state transmitter such as BE's FMi series for HD Radio and analog FM
- New audio processor for HD Radio

One other thing to consider:

- BE's FXi 60/250 exciter combines HD Radio and analog FM at the output of the exciter, so both can share a common transmitter. BE's FXi exciter offers this option inside the exciter, in DSP, so what comes out of the exciter is essentially one RF spigot with HD Radio and analog that'll feed the transmitter

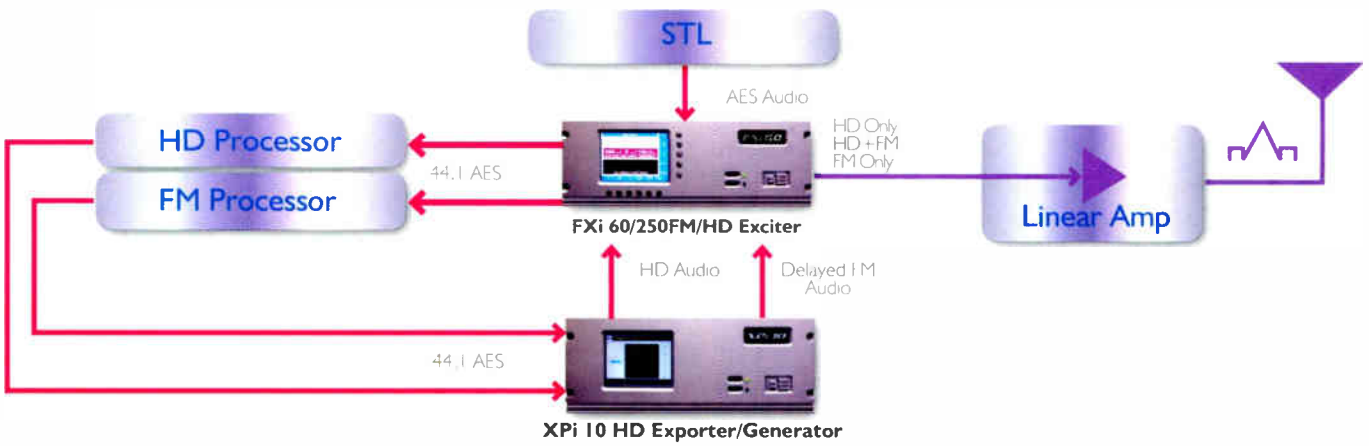
Pros and cons:

Low-Level Pros

- Less space required
- Less power consumed
- Less heat in building
- Easy installation
- Peak-to-average ratio is approximately 1.3 dB. (This means the transmitter is more efficient in this mode of operation over HD Radio only.)
- HD Radio and FM are transmitted through the same antenna, ensuring HD Radio to FM power ratios are maintained throughout antenna pattern

Low-Level Cons

- Single point of failure for both analog and HD Radio
- Requires replacement of analog transmitter



FM HD Radio Combiner Guide

High-level combined

HD Radio is combined with analog FM at the input to antenna.

HD Radio is amplified separately and combined with FM analog amplification via a 10 dB coupler at the input to an antenna; both analog FM and HD Radio share the same antenna.

Consider high-level configuration if:

- Have more than 14 kW TPO analog FM
- Existing transmitter or a transmitter you're planning to buy soon has enough headroom, about 10% more output power, to cover combiner losses
- Have available site space for separate transmitter

What you'll keep:

- Existing antenna, transmitter and exciter for analog

What you'll need:

- New BE FXi 60/250 digital FM exciter, an XPi 10 for HD Radio only signal generation at the studio or the transmitter site, and BE solid-state FMi transmitter operating in linear Class AB mode
- 10dB hybrid combiner, plus line and reject load, to produce the final mixed signal to the antenna
- Relocation of HVAC and/or additional capacity to handle combiner heat load
- New audio processor for HD Radio path
- Optional separate power meter to monitor the power ratio between analog and digital transmitter outputs

Pros and cons:

High-Level Pros

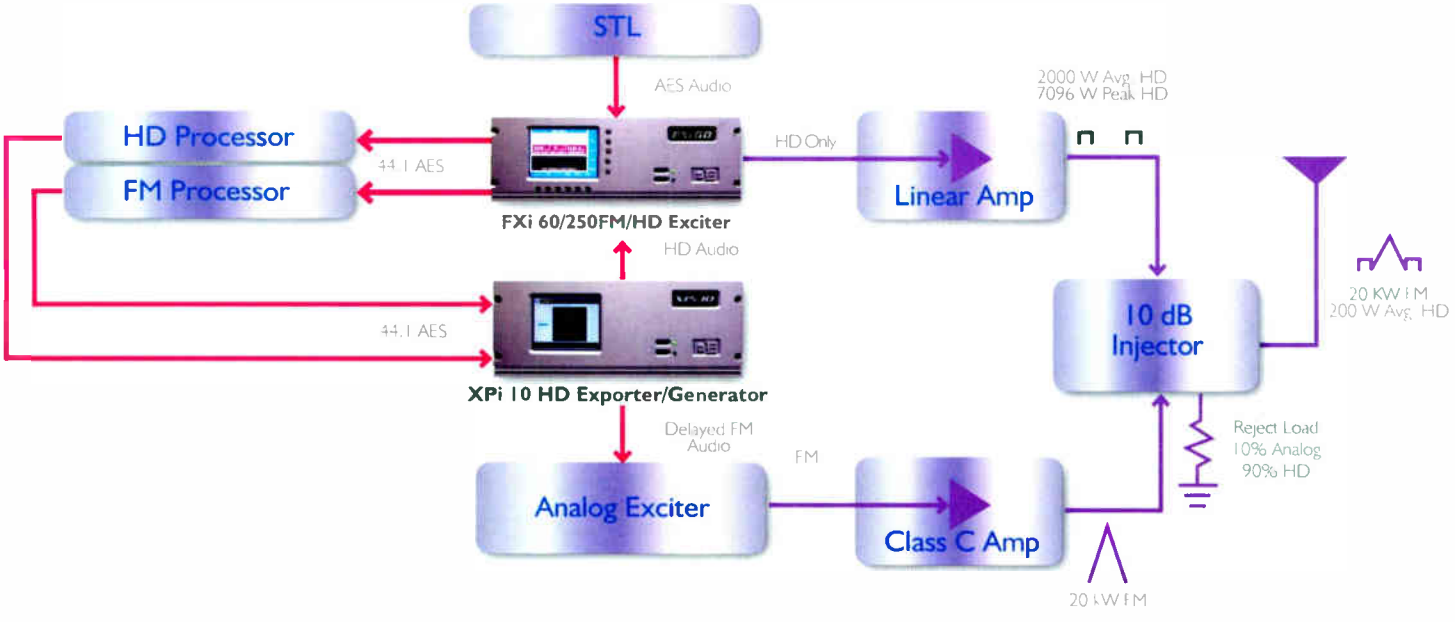
- Keep existing analog transmitter
- Analog FM and HD Radio operate separately in case of failure

Plus, BE's Total Radio Guarantee

- BE products can switch on-the-fly between HD Radio and analog FM operation. This provides the ability to backup your existing analog transmitter
- BE HD Radio and analog FM transmitters share PA, IPA and exciter components for easy maintenance of both products

High-Level Cons

- Existing transmitter for analog FM requires additional 10% TPO headroom
- Large reject load (90% of HD Radio and 10% of analog) due to injector loss
- Peak-to-average of HD Radio is 5.5 dB. This means the transmitter is less efficient than a low-level combined transmitter
- External coupler required (typically 10 dB)



Mid-level combined

Split configuration of main FM into two transmitters and combined with HD Radio into an existing antenna. Main FM analog is split between an HD Radio transmitter and a late model analog FM transmitter, which is operating at full nameplate power and lacks the additional headroom needed for high-level combining. The HD Radio transmitter amplifies HD Radio and a portion of the FM analog signal that has been phased to add at the output combiner with the signal generated by the main transmitter. The HD Radio transmitter is of higher power than that used in high-level combining in order to meet the HD Radio power requirement of 20 dB below main TPO plus any additional power needed for injector loss.

Consider mid level configuration if:

- Have more than 14 kW TPO analog FM
- Late-model, existing main transmitter does not have enough headroom to handle 10% more output, to account for high level combiner loss
- A separate HD Radio antenna is not an option due to tower space or structural limitations (or increased operational costs if tower space is leased)
- A dual feed antenna is not an option

What you'll keep:

- Existing antenna, transmitter and exciter for analog FM

What you'll need:

- New exciter
- New solid state transmitter operating in linear Class AB mode of sufficient power to handle HD Radio power at 20 dB of main TPO plus part of the main TPO
- External coupler, typically 3 to 6 dB

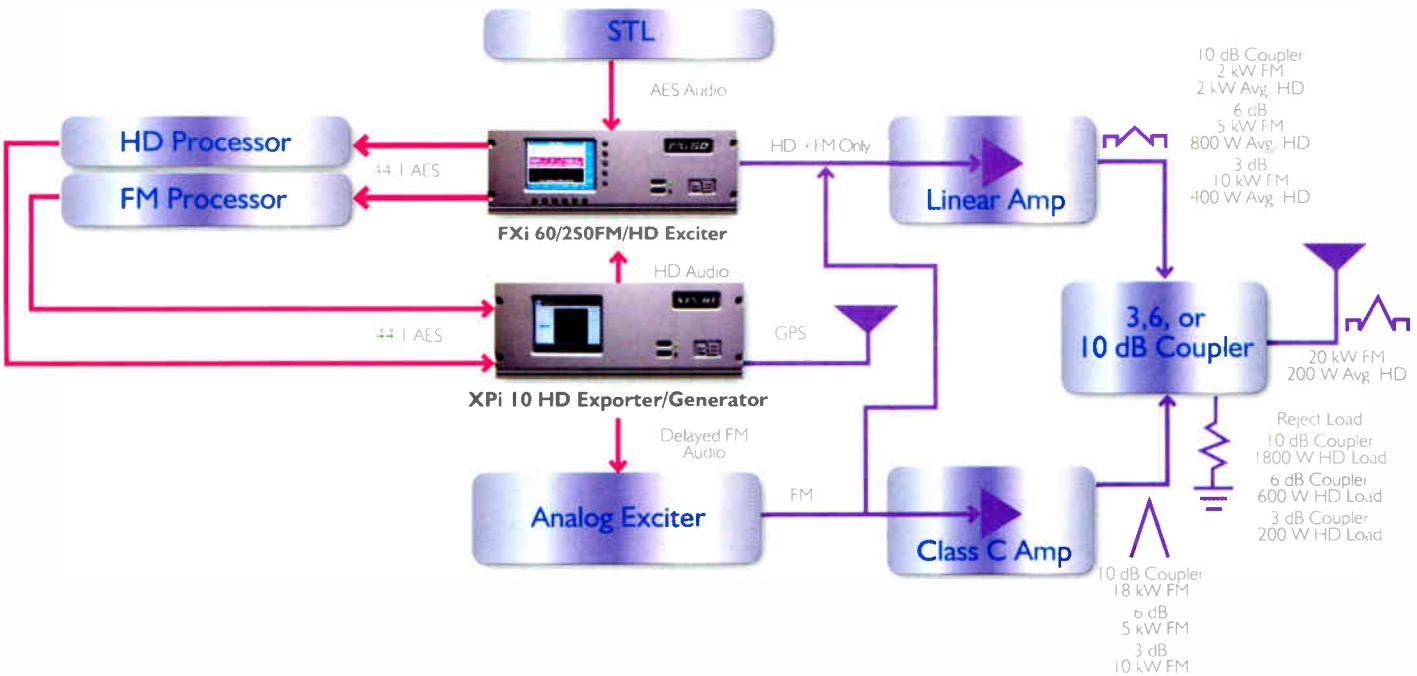
Pros and cons:

Mid-Level Pros

- Last resort for a Class B or Class C station with a late-model FM analog transmitter that doesn't qualify for high-level combining (lacks additional 10% headroom needed for injector loss) and a separate HD Radio antenna is not possible (no possibility of adding interleaved bays onto an existing antenna; no backup antenna available or antenna site won't allow for an additional structure.)

Mid-Level Cons

- Technically complex split combiner method with more failure points requiring regular adjustment of two dissimilar transmitters
- Need a higher powered HD Radio transmitter to amplify both the new HD Radio signal and the split off portion of analog FM
- The 1–5% efficiency gain over high-level combined is offset by the added cooling costs needed to dissipate combiner heat from the transmitter (high-level injector losses go directly to the reject load outside)
- The heat exhausted and energy consumed by the HD Radio transmitter is significantly greater
- Combiner is fixed; no on-the-fly backup operation allowed
- If the HD Radio transmitter fails, a large portion of the analog is diverted to the reject load. Depending on the coupling coefficient used, as much as 40% of the analog power will be dumped, leaving only 60% of the analog TPO into the antenna. In a high-level system, 100% of the analog TPO is still delivered to the antenna
- If the analog transmitter fails, as much as 75% of the analog FM developed in the HD Radio transmitter is now diverted to the reject load, leaving as little as 6% of the remaining analog power to exit the combiner to the antenna



Separate antenna

Separate HD Radio transmitter and antenna. HD Radio is amplified separately and run through a separate feed line and possibly antenna. The HD Radio antenna can be new, a backup not in regular service, an existing antenna that has been converted to HD Radio by interleaving additional bays, or a dual feed antenna. The antenna also can be a master community antenna that has been back fed HD Radio through an isolator for HD Radio/FM analog signal radiation at opposite polarities

Consider separate antenna if:

- Have more than 14 kW TPO analog FM
- Have the antenna infrastructure to add HD Radio (existing master or backup antenna) or the site space to mount an additional antenna
- Have an antenna that can be modified for dual-feed
- Have a late-model analog FM transmitter that has years of service left

What you'll keep.

- Existing antenna, transmitter and exciter for analog FM

What you'll need.

- New BE FXi 60/250 digital FM exciter, an XPi 10 for HD Radio only signal generation at the studio or the transmitter, and a solid state transmitter such as BE's FMi series operating in linear Class AB mode for HD Radio
- New antenna, bays or an isolator if the isolation between analog and HD Radio is less than 40 dB
- Optional separate power meter to monitor the power ratio between analog and digital transmitter outputs
- New audio processor for HD Radio

Pros and cons:

Separate Antenna Pros

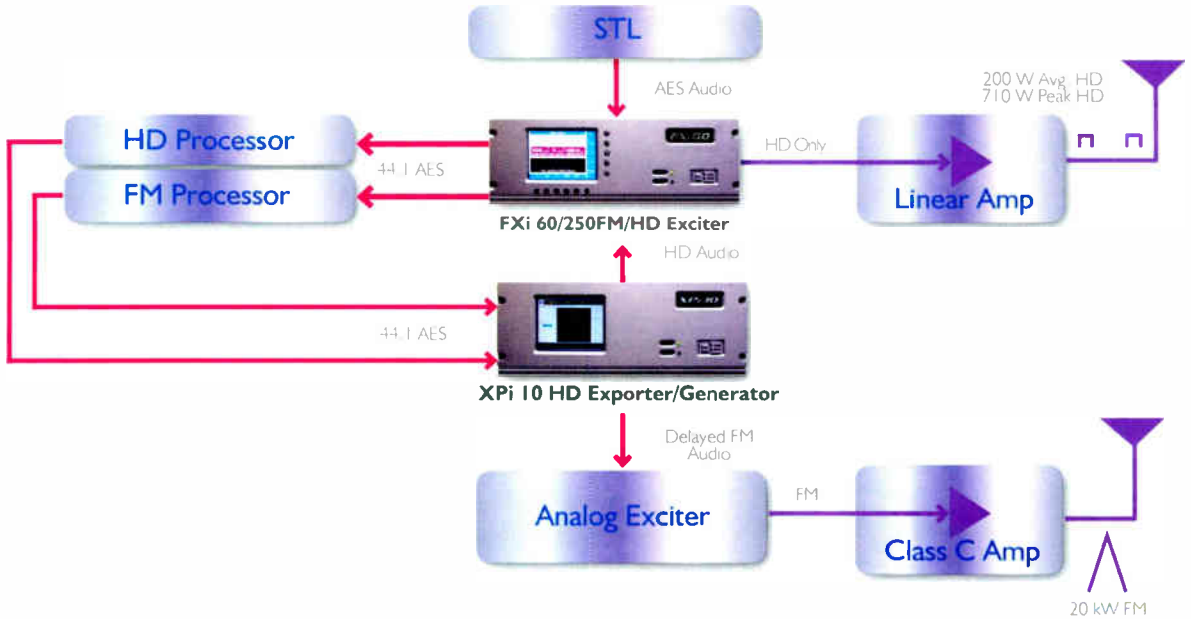
- Low powered transmitter for HD Radio (20 dB below main TPO)
- No combiner or combiner losses
- Lowest startup costs
- Simplified transmitter installation
- Keep existing analog transmitter with no additional power overhead required
- Most efficient operation of existing transmitter
- Have separate HD Radio and analog FM operation in case of failure

Plus, BE's Total Radio Guarantee

- BE products can switch on-the-fly between HD Radio and analog FM operation. This provides the ability to backup your existing analog transmitter
- BE HD Radio and analog FM transmitters share PA, IPA and exciter components for easy maintenance of both products

Separate Antenna Cons

- May need to account for gain differences (if any) between analog and HD Radio antennas
- HD Radio pattern may not be exactly the same as analog FM particularly if the antennas are not the same gain
- If dual-fed, must excite all elements or apply for STA
- Separate antennas require an STA (must maintain 70–100% HAAT and 3 seconds of latitude and longitude of main antenna; isolator may be required)



FM HD Radio Combiner Guide

Put flexibility behind your HD Radio plans

The HD Radio products you purchase today will determine what surprises, if any, you'll find on the other side of whatever door you choose. The key to any HD Radio system is operational flexibility – redundancy now and an upgrade path to new services later. A system cast in stone can compromise analog FM today, and lock you out of opportunities in text services and secondary audio services later.

Enter Broadcast Electronics HD Radio solutions

- Only BE delivers a choice in where you generate HD Radio, at the studio or at the transmitter, in preparation for second generation HD Radio such as Tomorrow Radio and data text services
- Only BE delivers a solution for point to multipoint distribution of HD Radio to station clusters in order to avoid unnecessary bit rate reduction coding in the audio chain
- Only BE delivers a PC free zone at the transmitter with Ethernet connectivity from the studio to the transmitter

BE HD Radio flexibility for redundancy:

All BE solid state FM transmitters currently shipping are capable of operating in Class C FM, Class AB FM only, Class AB linear HD Radio only, or low level FM + HD Radio linear hybrid mode. The FMi 703 and FMi 1405 models for HD Radio, which are based on the BE "S" series chassis, can be re biased on the fly via a remote command to operate in Class C or AB linear. Other FMi transmitters based on BE's "C" series transmitters (chassis sizes from 500 watts to 5 kW) are capable of switching to Class AB linear with internal jumper changes, thus protecting your investment if HD Radio is contemplated as a future upgrade.

In a high level combined system, an FMi HD Radio transmitter typically operating in digital mode can be switched into hybrid HD Radio/analog mode during an emergency, capable of delivering adequate analog power while maintaining HD Radio operation at the proper 20 dB ratio. Although 90% of both analog and HD Radio power would be dissipated in the reject load, a motorized RF transfer switch could instantly put the full output of the hybrid solid state transmitter into the transmission line. This operation could continue until the analog FM transmitter was restored to service. If HD Radio operation was not deemed essential, the FMi transmitter could be hot-switched to Class C with the press of a remote button, thus increasing to the full rated power of the FM transmitter in Class C mode.

In common amplification configurations, Broadcast Electronics uses one direct to channel digital exciter to combine the analog and HD Radio signals in a single hybrid RF chain. The FM and HD Radio signals are combined at low level and the single RF output from the exciter contains both FM and HD Radio carriers. There is no need for a second exciter or combining of two RF outputs, one digital and the other analog.

BE's FXi 60/250 FM digital exciter is the only exciter on the market that can be used for analog-only, HD Radio only or for both HD Radio and analog FM. It can be used in all digital configuration schemes, whether it's high level, separate or common amplification. The FXi:

- Provides emergency backup in case of main transmitter failure
- Provides fill in for a main/alternate system during switchover
- Allows power output to increase to maximum allowable in common amplification mode
- Can be controlled from the front panel or remotely with a relay closure
- Maintains FM and HD Radio ratios

BE HD Radio flexibility at the studio for data and Tomorrow Radio:

BE HD Radio systems are capable of HD Radio signal generation at the studio for multiplexing data, main and secondary audio into one data stream that can be carried over STL to the transmitter. This flexibility is made possible by the unique design of Broadcast Electronics' XPi 10 Exporter/Generator and FXi 60/250 digital FM exciter.

The XPi 10 HD Exporter/Generator and FXi exciter with Exgine plug-in option will be critical for getting HD Radio Secondary Program Services such as Tomorrow Radio from the studio to the transmitter site without adding another cycle of bit-rate reduction to get data and audio through the typical STL system.

BE HD Radio flexibility for station clusters:

BE HD Radio systems offer a cost effective, easy solution for point to multipoint HD Radio distribution to two or more transmitters in a cluster. BE's XPi 10 codes audio at the studio using the standard HD Radio coding algorithm and bit rate, which fits the transport rate required to send the program through a low bit rate terrestrial STL or satellite channel to all transmitters in the cluster.

What about new HD Radio capabilities as they come along?

Good question. Choosing how, where and with what to implement HD Radio is merely the first step. Gaining traction in the digital world of HD Radio, with new potential in text services and secondary audio such as Tomorrow Radio, will require equipment — and a company — that can go the distance.

All BE HD Radio products come with BE's Total Radio Guarantee ensuring compatibility with whatever the future holds for HD Radio.

New Nautel AM
Digital Transmitters

nautel

XR12
12 kW AM Digital Transmitter

Stay on the air
With power to spare

Quick Specs

- RF Output Power – 12 kW (rated)
  15 kW (capable)
- 145% positive peak modulation at 12 kW
- 1.5:1 VSWR at 12 kW, 100% modulation
- Dual hot-pluggable power modules and redundant standby module
- Dual DDS exciters with automatic changeover
- Plug and play integration with Nautel's NE IBOC AM HD Radio signal generator
- Built-in power preset scheduler allows for six preset power levels
- XR12 dimensions: 28.5" W x 72" H x 41" D
- New 25 kW and 50 kW XR transmitters also available

HD Radio™ Pure Digital. Clear Radio.

drm

The fourth generation of Nautel's 12 kW AM transmitter provides unparalleled performance and reliability, and supports both HD Radio™ and DRM digital radio. The modular XR12 is over-engineered to allow aggressive signal processing and up to 145% positive peak program modulation at 12 kW, producing more sideband energy and a stronger effective signal. The XR12's reserve power capacity also makes it ideal for simultaneous, full power AM analog and digital service.

The XR12's two power modules and one standby module automatically maintain full power even under fault conditions. Power modules are hot-pluggable and can be removed and replaced without any interruption in service. For even greater redundancy, the XR12 includes a complete standby DDS exciter and modulation encoder that automatically takes over when it detects a problem.

A 240 x 60 LCD graphical user interface, advanced alarm system, 128-event log and on-board real-time clock make operation, troubleshooting and system monitoring easy.

This combination of redundancy, in-service repair, automatic fault recovery and sophisticated alarming makes the XR12 the most robust digital AM transmitter available today.

Contact Nautel for details.

Phone: +1.207.947.8200 | **Fax**: +1.207.947.3693
info@nautel.com | www.nautel.com

SIMPLY THE BEST ENGINEERED TRANSMITTERS

TECH UPDATES

RVR Debuts Compact Amp, LCD Exciters

RVR Elettronica debuted a line of compact LCD products, including the PJ2500, a 2,500-watt compact power amplifier with high gain and low input. The company says the unit generates more than 2500 W of output power with approximately 25 W of drive input power, or 5 W with the "/LD" low driving power option.

The PJ2500 features eight parallel 350 W RF power amplifier modules, six of which are coupled through a Wilkinson splitter and combiner with strip-line technology. It retails for $17,995.

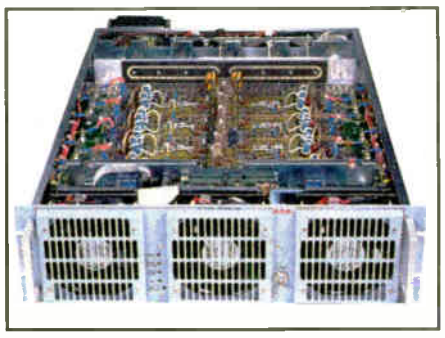
The front of the PJ2500M-C displays the amplifier's diagnostic and control parameters via GUI. The unit comes with a recycling overhead and protection system that, in case of fault, provides automatic restart after about 10 seconds of being in stand-by mode.

This procedure is repeated every 90 seconds for a total of four times. If the problem persists after four tries, the stop becomes permanent. If during one of the restarts the fault disappears, the counting circuit system is reset after a regular working period of 90 seconds.

If one or more power amplifier modules should fail, totally or partially, the amplifier will reduce output power to a safe value but will continue transmitting.

The PJ2500M-C comes with a terminals strip for telemetry and remote control, and replaceable standard modular components encased in a 6 RU unit.

RVR also released two LCD exciters,



the TEX50LCD/S and TEX150LCD/S. Both come with adjustable power output, 0-50 W and 0-150 W respectively.

The units are composed of four modules, and come with two SCA/RDS input connectors and internal stereo encoder. The retail price starts at $2,495.

For more information, contact RVR USA in Miami at (305) 471-9091 or visit www.rvrusa.com.

Bext Has FLX Series

Bext debuted its FLX FM series of 2 RU solid-state FM transmitters, available in FM power levels of 350, 650, 1000 and 1300 watts, and featuring a modular architecture. Each power level can be purchased for use as an amplifier, and an Exciter section can be inserted later as needed.

Units can be combined to achieve higher power levels up to 20 kW; and can be used as an amplifier only, or full FM transmitter with the addition of a slide-in Exciter module. A stereo generator and audio limiter are standard with each Exciter module.

A front panel USB port allows computer interface for remote control and status reporting capability.

For more information, including pricing, contact Bext at (888) 239-8462.

USER REPORT

WFRN Thanks 4K for Clean Signal

Crown's FM 4000 Transmitter System Is Rackmountable, Has Optional Digital Audio Processor

by James Bellaire
Technical Operations Specialist
WFRN(AM-FM) Radio

ELKHART, Ind. Since WFRN went on the air, our station has had close ties to **Crown**. Both the station and the electronics company were started by Clarence Moore, with WFRN Radio continuing under his son Ed's guidance, and Crown Broadcast (IREC) continuing under the guidance of Clarence's son Clyde Moore. WFRN still has in operation original Crown amplifiers and reel-to-reel machines.

The FM 4000 consists of two Crown FM 2000s run through a combiner. Each FM 2000 has its own PA system and power supply.

Crown Broadcast plays an important role in our daily operations. WFRN has two FM 100 translators to boost our signal in South Bend and Mishawaka, Ind. There are two additional FM 100 translators extending our reach into Kalamazoo and Coldwater, Mich., and an FM 250 translator extending WFRN's coverage in Marion, Ind. The various translators have been in place for seven to nine years with no failures.

We have had other problems at those sites, including other renters turning off equipment and damage to receive antennas; but the Crown Broadcast translators have survived.

Ready to run

With that track record, we wished we could get Crown transmitters for our full-power sites. They are reliable and easy to set up. The translators leave the factory ready to run — just add antennas and power and set the transmitter output. Plus, it is nice to do site visits that fit into my schedule instead of worrying about emergency runs.

WFRN operates 50 kW ERP WFRN(FM) 104.7 in Elkhart-South Bend, and two 6 kW ERP sites, 93.7 in the Kokomo/Peru area and 100.1 in Winamac. When the time came to replace our transmitter in Winamac, we were pleased to find out that Crown Broadcast could cover our needs. The Winamac station requires a transmitter output of 3,850 watts, and the Crown Broadcast 4K system handles that well.

The FM 4000 is composed of two Crown FM 2000s run through a combiner. Each FM 2000 has its own PA system and power supply. The 4000 also has an FM 250 driver. The system features 4,400 watts of output power, and can operate with the loss of one PA or PS at 1,100 watts. If both the PAs and PSs go down, it can operate at 250 watts exciter power.

The FM 4000 comes in at just under 300 pounds, and is rackmountable. Remote control capability is featured, and an Omnia DP-3 digital audio processor is optional.

We have had our Crown 4K in place now for 17 months. It can fit in the trunk of a car — no high shipping bill — and took a couple hours to install. I enjoy the clean signal output. Reliability doesn't count unless the station sounds good.

The only real problem we have had with the 4K was when our site suffered a direct lightning strike. One of the two power supplies was taken out; but due to its redundant approach, the station stayed on the air. I consider that a good design.

Repair was pretty easy. I collected the damaged power supply and PA and brought it back to the Crown Broadcast factory for repair. It was fixed as I waited, and was an easy repair thanks to the protection circuit.

In addition to the permanent installs, we had an unexpected need for a transmitter last Thanksgiving. WFRN's feedline and antenna burned during a storm. Through the help of Crown, the international tower crew of Towers of Jesus and the HCJB ministry engineering center, we were back on the air on an emergency antenna, borrowed from HCJB, within a day. And while we installed and tested our new feedline and permanent antenna, we had a Crown 2K serving our core listeners.

The FM 4000 retails for $41,885.

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

USER REPORT

KPCC Prepares for Digital With BE

After Winning an HD Radio Grant, Engineers Pick BE

by Ed Hollis, CBRE, CBNT
Chief Engineer
Minnesota Public Radio-
Los Angeles

PASADENA, Calif. It was an easy decision for Southern California Public Radio's news and information service KPCC(FM) to use **Broadcast Electronics**' HD Radio transmitter system, as other manufacturers didn't have competitive transmitters in the required power range. After several months of studying the literature and testing HD Radio systems, we chose BE's FMi-201 2.1 kW solid-state transmitter, FXi-250 exciter and FSi-10 signal generator.

KPCC started its HD Radio season in October 2004, and it's been a winner since.

Conversion testing

KPCC serves millions of listeners in the Los Angles market with 600 watts analog and 6 watts digital (ERP) from high on top of Mt. Wilson. The station began exploring digital systems in the fall of 2003 when the Corporation for Public Broadcasting announced it would award conversion grants in 13 selected "Seed Markets" to qualifying stations.

Engineers from KPCC and American Public Media Group, the nonprofit parent support organization of Minnesota Public Radio, attended many digital radio sessions at NAB, the NAB Radio Show and the local SBE chapter to learn more about the conversion. Also, Don Lockett's book "The Road to Digital Radio in the United States" provided valuable information to engineers and station management about the history of HD Radio in the world and America's conversion to the format.

First, KPCC and APMG engineers tested coverage in Los Angeles with a BE FMi31 HD Radio transmitter system in the spring of 2004 running only 6 watts ERP. The HD Radio receiver performance matched KPCC's analog coverage in our primary listening area. National Public Radio provided test assistance as part of its Tomorrow Radio project research. According to Mike Starling, NPR vice president of engineering, KPCC wins the honor of "Most People Per Watt" radio coverage in the United States.

Low-level combining was the correct choice for KPCC at 600 watts ERP. Before the digital conversion, KPCC ran BE 1.5A transmitters in Alternate/Main configuration. These reliable BE triode transmitters were in service for 12 years, but could not be made linear to pass the IBOC signal, nor did they have enough head room to overcome the injection loss of high-level combining.

However, our Jampro JMPC 1/2-wave antenna was broad enough and the feed line was bold enough to pass HD Radio, and neither of these needed to be replaced.

KPCC's transmitter plant is still an Alternate/Main configuration after the HD Radio conversion. Each system has a BE FSi-10 HD signal generator, FXi-250 exciter and FMi-201 final amplifier.

The author poses with KPCC's HD Radio transmitter system.

After digital transmitter system proposals were received and examined, KPCC selected Broadcast Electronics for its solution. A reasonable price and proven past performance were big factors in our decision.

At the time of KPCC's HD Radio transmitter purchase, the digital signal generator was positioned at the transmitter site along with the audio processing, but we knew that HD Radio technology would soon change this. So, BE assured us that when the upgrade to bring the signal generator and audio processor to the studios became available, KPCC would be the first to receive it and at no cost. Otherwise, we would have delayed the transmitter system purchase until the upgrade was available.

Heat dissipation

With the new BE HD Radio transmitter, KPCC's transmitter plant is still an Alternate/Main configuration after the conversion. Two identical digital transmitter systems are in place, and each system consists of a BE FSi-10 HD signal generator, FXi-250 exciter and an FMi-201 final amplifier. The transmitter systems are joined with a BE FA-2 Alternate/Main automatic transmitter switcher.

Air conditioning within the transmitter room was upgraded to handle the heat dissipated by the new and more powerful transmitters. Even though the digital equipment is solid-state gear, the heat produced by the FXi-250 and FMi-201 was too much for the old window air conditioning unit. A Sears 28,000 BTU AC unit was added to the room.

Heat dissipation within the transmitter equipment rack should be given extra consideration by the designers at BE if the FSi 10 signal generator is to remain at the transmitter, and not upgraded or brought to the studio.

FSi-10 signal generator reboot time after an AC power glitch can be as long as three minutes, an intolerable length of time in the Los Angeles market. So, an APC 5 KVA uninterruptible power supply was employed. This UPS unit conditions and provides constant power for the FSi-10, FXi-250, a Gentner VR-3000 remote control and Harris Intraplex STL HD.

Today, KPCC's programming is offered on its primary digital and analog channels. In the future, KPCC is planning to add other digital services to its HD Radio transmissions. BE is stepping forward with its XPi-10 exporter for HDR data applications and Radio Data Dimensions Software. These options and upgrades are now available from BE.

RDDS enables new HD Radio technologies such as Tomorrow Radio, Advanced Application Services for HD Radio datacasting, Program Associated Data (PAD) and Secondary Program Services (SPS). The XPi-10 is an exporter for HD Radio applications and facilitates redistribution of the signal generation process in order to conserve bandwidth in conventional STL systems and relocate audio processing to the studio.

The system retails for $123,000.

For more information, contact Broadcast Electronics at (217) 224-9600 or visit www.bdcast.com.

TECH UPDATE

BW TX600 Has Encoder, Limiter, 'Gold Change'

Broadcast Warehouse added the BW TX600 FM broadcast transmitter to its FM line of transmitters. It provides 600 watts output at more than 82 percent efficiency in a lightweight 2RU rack. Features include universal mains input, remote management and adjustable efficiency maintained power output from 50-600 watts across the 87.5-108 MHz band.

The TX600 uses the company's High-Efficiency Pallet Amplifier, which features "Gold Change" clamp technology, which the company says eases maintenance among other benefits. The series includes an optional remote control module and software.

Additional highlights include a digital stereo encoder, limiter and low noise, low distortion broadband PLL technology.

The TX600 retails for $4,988.

For more information, contact Broadcasters General Store in Florida at (352) 622-7700 or visit www.bgs.cc

The routing switcher gets a new twist.

(About five twists per inch, actually.)

Everybody needs to share audio. Sometimes just a few signals — sometimes a few hundred. Across the hall, between floors, now and then across campus. Routing switchers are a convenient way to manage and share your audio, but will your GM really let you buy a router that costs more than his dream car? Unlikely.

If you need a routing switcher but aren't made of money, consider Axia, the Ethernet-based audio network. Yes, Ethernet. Axia is a *true network*. Place our audio adapter nodes next to your sources and destinations, then connect using standard Ethernet switches and Cat-6. Imagine the simplicity and power of Ethernet connecting any studio device to any other, any room to any other, any building to any other... you get the idea.

Routers are OK... but a network is so much more modern. With Axia, your ins and outs are next to the audio, where they belong. No frame, no cards, no sweat.

Scalable, flexible, reliable... pick any three.

An expensive proprietary router isn't practical for smaller facilities. In fact, it doesn't scale all that well for larger ones. Here's where an expandable network really shines. Connect eight Axia 8x8 Audio Nodes using Cat-6 cable and an Ethernet switch, and you've got a 64x64 routing switcher. And you can easily add more I/O whenever and wherever you need it. Build a 128x128 system... or 1024x1024... use a Gigabit fiber backbone and the sky's the limit.

Are you still using PC sound cards?

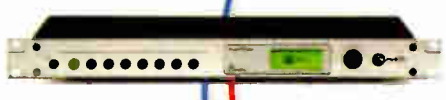
Even the best sound cards are compromised by PC noise, inconvenient output connectors, poor headroom, and other gremlins. Instead, load the Axia IP-Audio Driver for Windows® on your workstations and connect *directly* to the Axia audio network using their Ethernet ports. Not only will your PC productions sound fantastic, you'll eliminate sound cards and the hardware they usually feed (like router or console input modules). Just think of all the cash you'll save.

There's a better way to get audio out of your PC. No more consumer grade '¼" connectors – with Axia your digital audio stays clean and pristine.

Put an Axia Microphone Node next to your mics and send preamplified audio anywhere you need it, over Ethernet — with no line loss or signal degradation.

Put your preamps where your mics are.

Most mainframe routers have no mic inputs, so you need to buy preamps. With Axia you get ultra-low-noise preamps with Phantom power. Put a node in each studio, right next to the mics, to keep mic cables nice and tight, then send multiple mic channels to the network on a single Cat-6 cable. And did we mention that each Mic Node has eight stereo line outputs for headphones? Nice bonus.



Put your snake on a diet.

Nobody loves cable snakes. Besides soldering a jillion connectors, just try finding the pair you want when there's a change to make. Axia Audio Nodes come in AES/EBU and balanced stereo analog flavors. Put a batch of Nodes on each end of a Cat-6 run, and BAM! a bi-directional multi-channel snake. Use media converters and a fiber link for extra-long runs between studios — or between buildings.

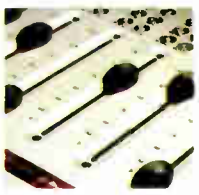
An Axia digital audio snake can carry hundreds of channels of digital audio on one skinny CAT-6 cable. We know you're not going to miss soldering all that multi-pair...

With a little help from our friends.

A networked audio system doesn't just replace a traditional router — it *improves* upon it. Already, companies in our industry are realizing the advantages of tightly integrated systems, and are making new products that reap those benefits. Working with our partners, Axia Audio is bringing new thinking and ideas to audio distribution, machine control, Program Associated Data (PAD), and even wiring convenience.

Would you like some control with that?

There are plenty of ways to control your Axia network. For instance, you'll find built-in webservers on all Axia equipment for easy configuration via browser. PathfinderPC® software for Windows gives you central control of every audio path in your plant. Router Selector nodes allow quick local source selection, and intelligent studio control surfaces let talent easily access and mix any source in your networked facility.



Control freaks of the world, rejoice: intelligent Axia mixing surfaces give talent complete control of their working environment. Reconfigure studios instantly and assign often-used sources just where they're most useful.

ENCO

PSI

radio

Scott Studios

BALSYS

Axia is already working with some great companies. Like Enco Systems, Prophet Systems, Scott Studios, Radio Systems, Balsys Technology Group, and of course Telos and Omnia. Check AxiaAudio.com/partners/ to find out who's next.

"This sounds expensive." Just the opposite, really. Axia saves money by eliminating distribution amps, line selectors, sound cards, patch bays, multi-pair cables, and tons of discrete wiring — not to mention the installation and maintenance time you'll recover. And those are just side benefits: our hardware is about half the cost of those big mainframe routers. That's right... *half.* Once you experience the benefits of networked audio, you will never want to go back. AxiaAudio.com for details.

AXIA
A TELOS COMPANY

TECH UPDATES

Burk OneConnect Enables Access to Nautel V10

Burk Technology's OneConnect interface gives broadcasters remote control access to the **Nautel** V10 transmitter via PC.

OneConnect offers remote control of the transmitter while allowing broadcasters to monitor additional plant equipment with the Burk GSC3000. A serial connection links the V10, shown right, to the GSC3000 transmitter remote control system, eliminating external wiring to the transmitter.

The GSC3000's Lynx 5 software presets detailed meters, controls and indicators for each remote control channel monitored by OneConnect. Lables, calibration and screen properties come ready to use; the company says no configuration is needed. The user interface can be edited, and new monitoring and control screens can be created using the software's Custom Views feature.

For control of ancillary equipment, OneConnect links to one or more GSC3000 I/O units with traditional wiring relays.

The company says managing the facility on one system offers options for central monitoring via a single control station; for distributed control using multiple PCs; or adding a voice or Web interface for telephone and/or IP control.

OneConnect retails for $2,795.

For more information, contact Nautel Maine Inc. at (207) 947-8200 or visit www.nautel.com.

Continental Features 816HD For 10-50 kW

Continental Electronics Corp. manufactures the Continental brand of FM transmitters, and offers the 816HD for 10 kW to 50 kW. The company says the 816HD series enables IBOC broadcasting using an existing antenna system, without needing an IBOC-only transmitter to be combined. Systems with a TPO of 10 kW-50 kW are possible.

The 418DRM 100 kW shortwave broadcast transmitter descends from a line of CEC 100 kW transmitters. Its operation is enabled through the standard amplitude modulation, AM, with controlled carrier-level modulation or optionally with SSB. The company says 418DRM was designed for the Digital Radio Mondiale digital broadcast system. Its amplifier tube is the 4CV100000C tetrode.

Continental's 816R series of self-contained transmitters range from 11 kW to 38 kW, and use one final power amplifier tube, 4CX15000A or 4CX20000E. The IPA is solid-state and does not require tuning. The series' "soft-start" circuit gradually brings the transmitter to full TPO, while low-voltage controls enable the transmitter to recycle and return to the previous operational status.

The 30 kW model has the high-voltage rectifiers and plate transformer in a separate chassis.

For more information, including pricing, contact Continental Electronics Corp. in Dallas at (800) 733-5011 or visit www.contelec.com.

Armstrong Tx B Series Are HD-Ready

Armstrong Transmitter says its B Series of FM solid-state transmitters use the FM2000B amplifier and offer high redundancy.

Each 2000B contains three power supplies, but only two are needed to achieve full power output. The company combines up to five 2000Bs in one rack with a combiner and exciter to provide stations between 4 and 10 kW output. Two 10 kWs can be combined for 20 kW output. The B Series can be linearized for use with HD Radio.

Additional features include metering of each amplifier and its power supply section, and transmitter metering. The transmitters also have VSWR foldback and protection and automatic power output control, and are remote control ready.

For more information, including pricing, contact Armstrong Transmitter at (315) 673-1269 or visit www.armstrongtx.com.

SHOWCASE

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USER REPORT

VJ35000 to Endure Montana Winter

Broadcasting Group Selects Bext's 35 kW FM Transmitter for Snowy, High-Elevation Site

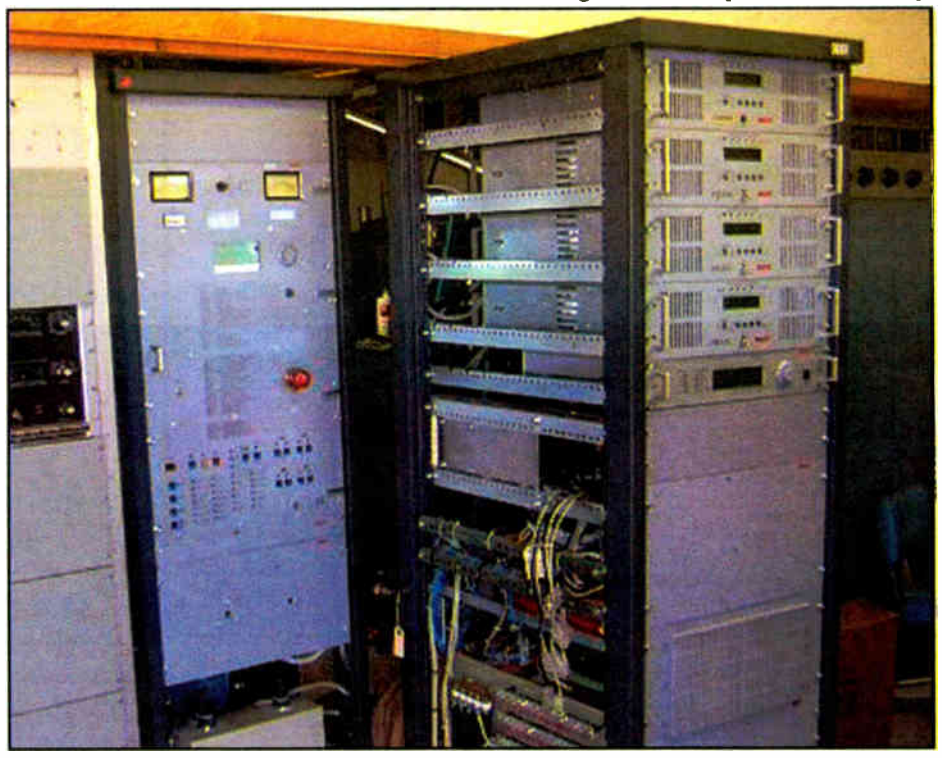
by Mike Powers
Chief Engineer
New Northwest Broadcasters

BILLINGS, Mont. The job of a group chief, managing as many as 38 stations, is never easy. But here at New Northwest Broadcasters, we also have to consider some additional hardship that folks in the milder parts of the country do not have to face.

We have stations in several Northwestern states, and many of the installations are in harsh climates, like Montana. This means that for us it is even more important to be able to rely on hardware that can be predictable and that can work consistently even during times when we can't get to it because of locations unreachable due to excessive snow and ice on our high-elevation transmitters sites.

We found **Bext** to be a supplier of reliable, predictable transmitters. We have always been impressed with the company's response to technical issues, which seems to be harder to come by these days from other sources.

So when it came time to select a 35 kW FM transmitter for our KGHL(FM) in Billings, our choice was the Bext VJ35000.



KGHL's VJ35000 FM transmitter

The VJ35000 is compact in two standard 19-inch rack cabinets, and was easy to install. The two cabinets are both on casters and can be positioned easily to the desired location within the transmitter site. Once they are placed, they can be bolted together. Then, park them securely on the floor by means of a practical threaded system that prevents the casters from moving.

The power supply and transformer come in a slide-in module, also on casters. Just slide it into an opening located on the back of the cabinet and secure it.

Wires and cables are well marked, although we did experience one problem with one of the cables.

We could not read any power on the front-panel analog meter. Fortunately, the transmitter also had a digital readout that tracked our external Bird Wattmeter, so we knew that everything was working and operating at full power. But we though the board that controlled the analog meter was faulty. So we called Bext and got a replacement board right away.

However, it turned out that we had plugged one cable into the wrong place during installation. We didn't even have to use the spare board. Once the cable was plugged into the right receptacle, the reading came up.

The layout and block diagram are intuitive. A 30-watt exciter drives a 1500 W IPA that consists of three individual 500 W amplifiers. Only about 1000 W is required to drive the final amplifier, so each of the three 500 W amplifiers is used only at about 300 W or so. And the way they are coupled allows the station to remain comfortably on the air, even if one of the three 500s were to fail and had to be removed for servicing.

The core of the final amplifier is an Eimac 4CX20000 tube. Cooling seems to be almost overkill with a giant blower system, but we know from past experiences more is always better when it comes to cooling a tube. The low-pass/harmonic filter is included inside the cabinet. The turn-on procedure is via pushbuttons on the front panel, where there are plenty of readings and controls.

The tuning and loading also are operated via pushbuttons, which in turn activate internal electric motors that adjust tune and load on the tube inside the cavity.

For more information, including pricing, contact Bext in San Diego at (888) BEXT-INC (239-8462) or visit www.bext.com.

Harris

▶ Continued from page 32

are indicated in these readings, which are reached through a series of soft buttons and LCD readouts. A universal fault status, one of many available status outputs, can remotely alert staff of performance issues via interface with the station's remote control.

Perhaps most important to the Z6HDs' performance is the Dexstar exciter, which generates the RF functionality and creates the IBOC signal. The Dexstar accepts digital audio conditioned by our HD Radio audio processor via Harris' ePAL, an integral device that provides data rate conversion and failure mode digital audio switching. The switching attribute routes the digital bitstream around the Dexstar exciter to the FM airchain directly should a failure occur, keeping the FM station on the air.

The Dexstar provides the IBOC signal for the HD Radio transmitter's pre-corrector stage, along with a delayed digital audio stream for the FM airchain. The IP1D pre-corrector functions provide the signal cleansing and amplification out of the exciter to let the IPAs do their job — all resulting in a clean and powerful HD Radio signal transmission to Western Massachusetts.

The IP1D ensures that the HD Radio sub-carriers follow the FCC's requirements regarding allowable FM spectral emissions.

The Dexstar exciter is a Linux-based device featuring an intelligent graphical user interface. The GUI displays metering and different operational parameters found within easily navigable menus. An early software issue with the exciter was cleared up quickly with a simple software update, confirming Harris' excellent customer service and ability to troubleshoot for the benefit of WFCR.

An important Dexstar function is the delaying of the station's FM digital audio stream to match the timing of the decoded HD Radio audio heard by the listener. This facilitates the receiver's "blending" feature for a seamless transition back to the FM carrier should the HD Radio signal fail to provide enough data for the receiver's buffer — usually because of terrain or distance from the listener. The amount of FM digital audio delay is adjustable in the Dexstar's menu to help ensure a smooth transition.

The Harris Z6HDs completes an HD Radio package. It's our belief that Tomorrow Radio and its multi-channel possibilities will be driven by the public's acceptance of HD Radio. Our STL will soon be capable of delivering up to four studio-originated channels to the Z6HDs.

And as we prepare for the next wave in terrestrial digital broadcasting, we are proud to be an early adopter of HD Radio and experience its growth as we move forward.

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

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Jampro JSCP-5, 5 bay antenna with radomes. On the ground and in good condition, $5000, buyer pays shipping. This is a heavy duty antenna useful to 20kw TPO and tuned to 94.1 Mhz. Lee Schafer, KBXL, 1440 S Weideman Ave, Boise ID 83709. 208-377-3790. email: lee@myfamilyradio.com.

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www.rwonline.com

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Arrakis DL-3 with 7 channel switcher DL-SW-7EX, power supply DL-PS-1 and cables, $700. Wilmer Borneman, WBYN, 280 Mill St, Boyertown PA 19512. 610-369-7777.

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Arrakis Digilinks II & III, especially hard drives. Will take working & non-working digilinks as long as parts are still in good condition. Need mostly III's but will take II's. Lane Goodwin, KWYN, 2758 Hwy 64, POB 789, Wanne AR 72396. 870-238-8141.

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Orban 8100A Optimod in excellent condition w/manuals, $1500. Ken Lane, Rolling Plains Bdctg, 1102 North Ave G, Haskell TX 79521. 940-864-2597.

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CRL SEC800 spectral energy compressor. Randy Swaffer, WEEN, 231 Chaffin Rd, Lafayette TN 37083. 615-666-2169 or rswaffer@nctc.com.

Late model Orban Optimod 8100 w/XT chassis. Prefer LED meters. Call Stan 478-946-3445 or email: love1037@alltel.net, with price.

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Professional microphone collection (73), Western Electric, RCA, Shure, Altec, and Sony. All mics like new, re-ribboned, etc. Will sell as package only. Bill Cook 719-687-6357.

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Comrex Nexus ISDN remote unit $1,250 or b/o, very. good condition 425-304-1381. andrew.skotdal@krko.com

Telos Zephyr digital network transceiver, remote panel; ADLRAN (DSU 56/64), 4 years old, like brand new, just used a few months. Radio Payam-E-Afghan, 20944 Sherman Way, Ste 207, Canoga Park CA 91303. 818-253-7295.

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Want to Sell

1,000 watt AM station in North Central, NY state. Harris transmitter along with 12.2 acres of property included. Has CP to raise tower height and Main Studio Waiver. Please visit www.bbnradio.org/sale for more information as well as information on five satellators for sale in the Midwest. Contact Mike Raley at mraley@bbnradio.org or call (704) 523-5555.

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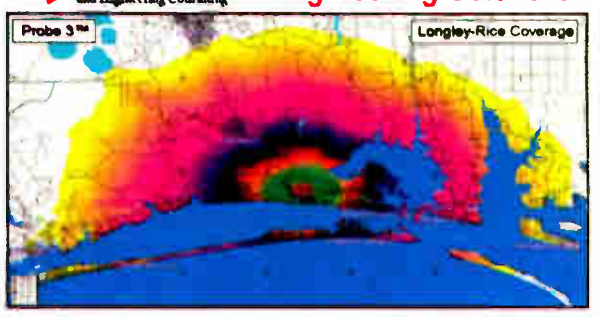

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Hardworking, quick learning rookie DJ wanting to get feet wet in the business. Will do and learn anything to get the job done right! Will travel. Cliff at 405-620-2499 or clifharden2000@yahoo.com.

Recent ABS grad and rap aficionado, looking for an opportunity in the broadcasting industry to use my talent and expertise. Willing to travel. Leelo 405-323-2668.

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Lively, outgoing, witty and spontaneous. Hot on-air personality or board-op that's ready to work in the radio broadcasting industry. Landon 682-554-6770 or thebig1_04@yahoo.com.

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Rookie broadcaster looking for the chance of a lifetime. Capable of writing, copy, announcing and digital production. Willing to relocate. Hotshot (yes, that's my real name), 405-604-0211.

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GUEST COMMENTARY

Use Lasers for Close-In Points

The Author Says Laser Range Finders Enable More Accurate Measurements for AM Proof Reports

by Bob Culver, P.E.

While reading "Close-In AM Field Intensity Measurements" (March 16) and the "Right Tool for the Job" side bar, I noted the discussion of measuring distances accurately by way of the knotted rope.

Please consider the following as a follow-up to that subject.

If there is one thing the FCC wants in AM proof reports, it is accurate data. Accurate data also is in the engineer's best interest — for future uses, and to avoid causing problems with the FCC.

Swamp thing

Many years ago, I was involved in making measurements in the Everglades in Florida. The problem was there was no easy or legal access to the swamp and no useful landmarks, especially so for the close-in points. The station was a multi-tower array with a central transmitter building, surrounded by miles of swamp.

We had to turn to helicopter measurements. And to this day, the FCC refers to that proof report as an example of acceptable helicopter measurements.

Such measurements are acceptable by the FCC if you can prove the relationship of the aerial measurements to the values that would be measured on the ground; and prove you knew where you were for each measurement. Both tests were satisfied and the latter will be addressed below.

The swamp area and the modestly tall transmitter building yielded an area and vantage point from which to direct the measurements. A theodolite and laser range finder were set up on the roof of the building. This was just at the dawn of laser distance measuring procedures, but a procedure and equipment were worked out.

The theodolite was set up on the building flat roof and sighted on the few easily identified landmarks, like water towers, and the true north azimuth was thus identified. Then each radial azimuth could be dialed in. The range finder was set next to it. The non-directional tower and the array center were a short distance away and close-in corrections for distance were easily made by simple trigonometry.

The helicopter was equipped with the measuring meter in a window mount and retro-reflectors were attached to it. The ultimate ranging distance was in the range of four to six miles, depending on heat mirage conditions.

The small and underpowered helicopter could maintain a slow forward speed near ground level — in the area of ground effect — and was surprisingly stable in that mode of flight. Further out, higher speeds and altitudes worked better.

Each radial was run from the furthest point moving inward. When it was seen in the theodolite scope and good ranging data was obtained, the measurement process started.

The helicopter was advised to fly right or left to keep it on line, and at relatively uniform time (distance) points a "mark" command was given by radio. That was the cue to read the meter, relay the reading back by radio and simultaneously read the range finder and write down the data. The process was repeated at short intervals with the helicopter speed adjusted to make the distance between points less for closer points.

As the array was approached the pilot had to maneuver so as to not hit towers while redirecting his path from the observation point toward the array center or non-directional tower.

The data was analyzed and the following processes were applied. A trigonometric correction was applied to the distance measurements to reflect distance from the non-directional antenna or array center accurately. The measured distance was truncated to the nearest foot and then converted to miles to tow decimal points. Normal plotting and analysis then followed.

For much longer radials, 10 miles or more, a similar process was used except a landmark visual navigation process was substituted.

Easily identifiable landmarks, such as canals, hammocks and occasional roads, were marked on topographic maps near each radial. This yielded known distance and guidance points for each radial path as the flights commenced. A recorder was coupled to the field meter and an event marker was actuated as each landmark was passed. Such paths were flown at higher elevation and speed, and an entire radial could be measured in about 30 minutes flight time.

You should see the beautiful Field Strength nulls that occurred when the aircraft passed over the top of the non-directional tower.

Seen and lased

So, what is this all about? I strongly suggest using a laser range finder for measurements at close-in points. They are now inexpensive, small and easy to use. Accuracy is not a problem at all — they are accurate to +/- a meter or two and repeatable.

If the non-directional tower can be seen it can be lased. A monopod on the meter makes it easier to hold to make measurements and at the same time makes for a stable point on which to rest the laser range finder.

If necessary a temporary target can be attached to the tower. I suggest about five feet of Scotch reflective tape at an easily seen location will give good signal reflection.

If practical, the observation point process we used could be applied with the helper, data writer and laser operator situated at the station and the reflecting surface attached to the meter case. Where intervening terrain, buildings or foliage occurs, intermediate reflective markers can be established. But when such conditions begin to become common, the area will no longer be "close in."

Today, the right tool most likely does not include knotted ropes or surveying chains.

Bob Culver, P.E., is a partner with Lohnes & Culver, Consulting Communications Engineers in Laurel, Md.

IN THE INDUSTRY

Clear Channel: 'Leading Change'

The following is an excerpt from Clear Channel's 2004 Shareholder Letter, signed by Chairman Lowry Mays, President/CEO Mark Mays and Executive Vice President/CFO Randall Mays. In the letter, the company told investors that 2004 represented the "best financial performance in Clear Channel's history." It said this performance "highlights a key aspect of our operating strategy that was critical to delivering results and laying the groundwork for impressive growth over the long term: Leading change."

The company outlined its business situation in the radio, outdoor, entertainment and television sectors. Here is part of what the letter said about radio.

The radio industry is changing. And Clear Channel is leading the way. This past year, Clear Channel Radio launched what some consider the most significant initiative in the radio industry in the last 75 years. We started with a simple premise: fewer, shorter and better radio commercials would make radio better for listeners, advertisers and the industry as a whole.

In an initiative we call "Less is More," we reduced commercial minutes on our radio stations by an average of 19 percent and transitioned to selling more 30-second advertisements instead of the customary 60-second spots. To help speed that transition, we partnered with some of the greatest minds in advertising and marketing today to form a unit called the Creative Services Group.

This group serves as an unprecedented resource for our stations, ad agencies and advertisers. Its sole focus is to make commercials more compelling and entertaining. And to make sure we're doing everything we can to support the initiatives undertaken, we changed our sales compensation structure in the radio division, rewarding value instead of volume.

The value for listeners is obvious — more of the programming that they love and fewer, better ads. But for advertisers, the benefits are equally compelling. Reducing commercial clutter and providing higher quality and more effective commercials increases the effectiveness of radio advertising. More of our advertisers' messages will be resonating with the people they want to reach.

Extensive in-house research and a review of several independent studies show that listeners remembers shorter ads just as well as longer ones. And given that a 30-second campaign can actually provide greater reach and frequency than a 60-second campaign, the end result is a better listening environment for audiences, and more value and return on investment to the advertiser.

All told, "Less is More" is a major change in how we do business. While it is still early, we couldn't be more pleased with the results so far. "Less is More" has been heralded by listeners, advertisers, Wall Street and even by our competitors. It is the right thing to do for Clear Channel and the radio industry over the long term. It is a great example of how we are leading change.

Digital radio (also) affords us the ability to bring listeners data and other related services. Examples include on-demand traffic and weather and other programming, like splitting a channel on a Friday night to broadcast the local high school football game or bringing smooth jazz to a community that is heavy on rock.

Continued investment

While 2004 will be remembered as the year we introduced "Less is More," it also will be remembered as one of our best and most important years in programming. Our programming is as vibrant as the communities we serve and as dynamic as the markets we operate in. No one invests more in radio programming than Clear Channel Radio and the results are impressive.

We are attracting new on-air talent in radio. Most notably, we introduced "Keep Hope Alive with the Rev. Jesse Jackson," and "Trumped!" with Donald Trump, to large, medium and small markets around the country. Indeed, "Trumped!" was the largest launch of any program in radio history. But we didn't stop there.

We expanded or created entirely new music formats. For example, we significantly increased our commitment to serving the growing Hispanic community, launching four new Spanish language radio stations in 2004, and creating the "Hurban" and "La Preciosa" formats, among others. We also became the single largest broadcaster of progressive talk programming, airing the format on 22 stations with an innovative combination of national network and local talent. And finally, we announced an expansion of our online radio effort to bring our thousands of beloved local brands to life on the Internet and look forward to sharing more information on this important effort in the coming months.

We continue to introduce new and emerging artists. In acceptance speeches during this year's Grammys, Radio Music Awards and elsewhere, leading musical artists, including Alicia Keys, Nelly and Ryan Cabrera have publicly credited the support of local Clear Channel Radio program directors as instrumental in launching their careers.

These local program directors, in Chicago, St. Louis and New York, are just a few of our more than 900 local program directors across the country whose passion for music and deep connection to their listeners is apparent on every one of our stations. Our continued investment in local market research, paired with the "golden gut" that is the hallmark of great radio programming, enables us to attract and keep the most loyal of audiences and raving fans that are now 100 million strong.

We concluded the year with more stations broadcasting in high-definition digital radio than any other broadcaster. Over the next three years, almost all of our stations in the country's top 100 markets will be doing the same.

We continue to lead the way in investing in new technologies. Our focus this year has been in two high-growth areas: online radio and digital broadcasting.

The Internet presents an important high-growth opportunity and so we're building on the nearly 200 local stations currently streaming broadcasts from station-specific Web sites. In the coming months, we will be delivering exclusive content including in-studio performances, custom music videos and artist interviews to those sites even as we develop complementary online radio and music programming.

In addition, we lead the industry in commitment to high-definition digital broadcasts. We concluded the year with more stations broadcasting in high-definition digital radio than any other broadcaster. Over the next three years, almost all of our stations in the country's top 100 markets will be doing the same.

Digital radio provides us with the ability to deliver radically improved CD-quality radio programming and reception, and affords us the ability to bring listeners data and other related services. Examples include on-demand traffic and weather and other programming, like splitting a channel on a Friday night to broadcast the local high school football game or bringing smooth jazz to a community that is heavy on rock. Applications for digital delivery platforms are immense. You can expect us to continue to lead the way. By making these investments today, we are ushering in a new era of radio, one that we are very excited about.

Abroad

For these reasons and more, our stations continued to rank either at the top or among the top three in local-market ratings in 2004. Listeners are choosing Clear Channel Radio stations every day, in every market we serve.

Innovation and leadership were also keys to driving our success at Clear Channel's international radio operations. By partnering with local joint venture partners, Clear Channel is providing quality programming and services to communities in Australia, New Zealand and Mexico through over 220 radio stations outside the United States.

The Australian Radio Network grew revenue faster than any other Australian radio group in 2004. Our New Zealand Radio Network grew its reach by introducing new formats and adding new stations. And together with our partner in Mexico, Grupo Acir, we introduced new services, like our innovative new traffic and weather network.

We are very proud to report that across all of our international markets, we are solidifying relationships with advertisers who are using radio as a marketing tool for the first time.

The company's letter to shareholders also discussed the company's support of the Ad Council, the Multiple Sclerosis Society, the Children's Miracle Network, the USO and St. Jude's Children's Hospital, among other community service efforts. It said it also "actively supported the election process" by enacting strategic initiatives, covering the major political conventions and partnering with the Declare Yourself youth voter registration project.

Among its conclusions, Clear Channel wrote that, "Looking at our accomplishments in 2004, it's hard to believe that the industries in which we compete have been around for decades. While our parents and our grandparents have grown up enjoying the media and entertainment services we offer, the exciting initiatives described in this letter demonstrate that our businesses are anything but mature."

How to Submit Letters

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as the issue date and your job title and company if appropriate.

Send letters via e-mail to *radioworld@imaspub.com*, with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, P.O. Box 1214, Falls Church, VA 22041.

◆READER'S FORUM◆

CONELRAD Testing Date

I read with interest Buc Fitch's article on CONELRAD (March 16). The article contains a couple of minor date-related errors.

The date of the national test was in the summer of 1956, I believe in late June or July. It occurred early one afternoon. I had been in the radio business for a short period when the test occurred, and was a board operator at a small local station.

This Gonset two-meter ham transceiver shows the CONELRAD logo.

We discontinued programming a few minutes ahead of the scheduled time to allow the transmitter to be retuned to 640 kHz, and the relay switching system for the carrier on/off control system to be connected to the transmitter. A DC circuit from the local telephone office was routed to the transmitter site and the programming came from an audio loop from toll test to the studio, which was maintained for the purpose.

I have no recollection of any subsequent tests through 1965, when I left the operations area of the business following graduation from college.

The system remained in operation through about 1973 or '74, not 1963, when the system was replaced by the two-tone (EBS) alerting system.

The CONELRAD system alerting procedure consisted of a five-second carrier break followed by silent carrier for five seconds, another five-second carrier break and 15 seconds of 1000 cycle (cycle, not Hertz) tone followed by the test or alert message. Many will remember the Cheyenne Mountain Saturday morning test fiasco in 1971 when the "real thing" message was sent at the time of the regular weekly test transmission.

The system was developed to deny the enemy the use of broadcast stations as a navigational aid. The VHF Omnidirectional Range (VOR) navigation system was not widely deployed in the early 1950s, and Low Frequency Range and broadcast stations were commonly used for aerial navigation purposes. CONELRAD was obsolete in a short time as the VOR system was rapidly implemented in the 1950s.

Keep up the historical articles. They are enjoyable.

J. S. Sellmeyer, P. E.
Sellmeyer Engineering
McKinney, Texas

Fitch replies:

Jack Sellmeyer may very well be correct on the date of the "nationwide" test, although two sources indicated the 1961 date.

It's possible we are discussing regional testing, with the 1961 event strictly an East Coast phenomenon; many were concerned that invasion from Cuba was a possibility in those Cold War times.

It is my understanding that although the carrier kill/alert tone system was in place right up to the introduction of EBS, the multi-station transmission system was decommissioned earlier, in 1963.

I'm surprised that Jack's station had to go off to retune. Cris Alexander of Crawford Broadcasting has mentioned that at his 560 Denver station, changing to 640 was a "one-button-push" affair.

Several stations I visited in the 1960s had separate CONELRAD transmitters, ATUs, etc., and the changeover involved a change of antenna inputs.

Satellite Bash

Instead of bashing satellite radio using misinformation, columnist Guy Wire should have read the whole business history of DirecTV and Echostar ("Keeping Score on Satellite Radio," Radio World Engineering Extra, Feb. 23). He would have found the same ignorant analysis written of satellite TV in 1996.

The satellite television business is successful, as satellite radio will be.

Thank goodness he and his political friends can't remove the Constitution. Free speech and the right to have access to media create companies like XM and Sirius, while groups of people to support these ideals will continue to exist, as well. XM and Sirius will survive and provide an uncensored conduit for news, political talk, entertainment, sports and music.

OTA radio and television is not serving the public interest, and the FCC's political interest is the major cause of this downfall — not technology. It would have been productive to write on how to reform the FCC or get OTA radio back on track, helping to reform the FCC and rebuild OTA broadcasting. You accomplish the opposite by bashing satellite radio. Using misinformation to bash something that was formed because OTA radio isn't doing its job is counter-productive. It doesn't even get your readers to contact their congressman or senators.

As for HD Radio, the FCC will screw that up too, just like it did with AM stereo and DTV. We could have had OTA radio (AM and FM) that was reliable, good-sounding and money-making if the FCC had been reformed and stripped of most of its power back in the 1930s. Today there is not one AM or FM station that can pass a proof of performance test as defined by the FCC of 1960.

The FCC in its infinite foolhardiness has limited coverage so only large cities are served, forgoing the suburban and rural markets. Satellite television, and now satellite radio, got its start because OTA broadcasting and access to diverse programming was limited. DirecTV, Echostar and Zoom came into existence because cable didn't make the urban investment, and OTA television was too controlled. If Guy Wire thinks satellite radio is unnecessary, he can thank the FCC for its existence.

If he wanted to do some good, he would become an advocate for the reform of the FCC, turning the frequency allocation portion over to the Department of Commerce, and letting the marketplace decide what programming goes on the air and what the coverage area is. The FCC is killing OTA radio and trying to kill all freedom for television programming too. The FCC doesn't belong in the censorship business, and it's doing a regrettable job of setting and maintaining technical standards.

Controversy is good, but the author of such hateful bashing should be identified. It's time to own up to this misinformation and political bias.

Richard Majestic
Santa Cruz, Calif.

CPB Doesn't Need Ombudsmen

Those in power are eating away at the First Amendment and the fourth estate while telling us they are offering more protection.

Historically, the FCC's mandate was to stay out of programming. Times have changed and clearly the commission is involved in programming, through the so-called indecency regulations, which are being hammered home and strengthened by the Republican-controlled Congress and the Bush Administration.

Now, matters have spread to the public broadcasting arena. The Corporation for Public Broadcasting, created by Congress to grant federal money to public radio and TV and to act as a buffer between the two groups, has hired Ken Ferree as executive vice president and COO. He will serve as acting president while the CPB board searches for a successor, and he has said he wants the top job.

Ferree is ex-chief of the Mass Media Bureau, brought into the commission by former chairman Michael Powell, a Republican.

Next, CPB, a quasi-federal entity supposedly not involved in programming, creates an ombudsmen's office. The stated purpose is to insulate public broadcasting from congressional and administration critics; but, as CPB itself stated, the purpose is also to make sure programming is "fair and balanced."

Just three days later, CPB President Kathleen Cox, in the job for only nine months, resigns abruptly. The Washington Post quotes former CPB President Robert Coonrod as saying he had groomed Cox for the job for four years. The Post appropriately asks why someone groomed for four years quits after less than one, but doesn't get an answer. Even the president of PBS, Pat Mitchell, was surprised.

Mitchell stated of Cox: "She recognized the need for CPB to remain a strong heat shield to protect public media from political pressure."

Jeff Chester, executive director of advocacy group Center for Digital Democracy, told the Post, "The fact is she was basically an apolitical bureaucrat in an incredibly polarized agency."

National Public Radio took it upon itself to establish an ombudsman, an unusual but welcome step for a U.S. broadcast organization. PBS is considering it after being rebuked by Education Secretary Margaret Spellings for using some of her department's program funds on an episode of "Postcards From Buster" in which the title character, an animated rabbit, visits children in Vermont who are living with their two mothers. Spellings demanded, according to the Post, that all mention of Buster be removed from that episode, which PBS subsequently announced it would not distribute.

It's appropriate for the networks to have ombudsmen. It's appropriate that public radio and television initiated these offices on their own.

It's inappropriate and transparent for Congress and the administration, through Republican board members, to force it on CPB.

— RW

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