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Radio World®
The Newspaper for Radio Managers and Engineers
August 2, 2000

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DIGITAL NEWS

USADR + LDR = iBiquity Digital

The New iBiquity Digital Corp. Will Blend Technologies; IBOC Supporters Call It Good News

by Leslie Stimson

First, they cooperated to develop in-band, on-channel digital audio broadcasting. Then they split up to pursue their goals separately. Now they are poised to work together again, this time as one company.

USA Digital Radio Inc. and Lucent Digital Radio Inc. are merging, and nearly everyone involved in or watching the development of IBOC DAB praised the news.

"Today, digital radio takes a major step toward becoming a reality," said USADR President/CEO Robert Struble.

Even IBOC doubters agree that the decision to put aside competitive differences and work to develop an IBOC standard eliminates a big obstacle to getting the technology into the marketplace.

That goal is more important, observers agree, as radio faces competition from other mobile and portable technologies such as MP3, the Internet, and soon, satellite-delivered DAB.

See IBOC, page 6 ▶

LDR's Suren Pai and USADR's Robert Struble

Pubcasters Launch New Bird

by Eric Hoehn

With the launch of its replacement satellite, the Public Radio Satellite System has replenished its satellite capacity and begun a system-wide project to make station downlinks more agile.

An update on this project, plus a discussion of how audio would be delivered to public radio stations in the future, were covered in a session at the recent 2000 Public Radio Conference in Orlando, Fla.

See PRSS, page 3 ▶

NEWSWATCH

Fidelipac Cart Business Acquired

FRAZER, Pa. LPB Communications Inc. has sold its analog cart machine product line, which it had gained as a part of its recent acquisition of Fidelipac.

The product line of cart machines and cart tapes has been sold to CartGuys President Jim Martin and Vice President Barry Mishkind, who make up the Tucson, Ariz.,-based business "CartGuys." Terms of the deal were not disclosed.

Why buy what some would call a dead technology? "There are guys who laugh at us for doing this but we see a market," said CartGuys President Jim Martin. That market includes stations that have all their programming on tape and do not want to switch to a computer editing, storage and playback system and stations that use analog carts and cart machines as back-up equipment.

The new owners plan to develop new business both in this country and overseas as well as reenergize sales and service of cart machines and tape cartridges to the existing customer base.

Mishkind will focus on marketing, new business and product quality. Martin will handle existing accounts and production. Mishkind is also a contributor to **RW**.

The new owners were looking at office locations in Arizona at press time. Product inquiries may be e-mailed to Mishkind at *barry@broadcast.net*

Fidelipac has been producing analog carts since the late 1950s and introduced the Dynamax cart machine in 1985.

LPB will retain the Fidelipac and Dynamax trade names.

Tech-Sym Finds Buyer

HOUSTON The parent company of Continental Electronics Corp. — Tech-Sym Corp. — found a willing buyer in late June.

New York-based investment firm Veritas Capital Fund L.P. agreed to buy Tech-Sym for about $182 million in cash. The deal values Tech-Sym at $30 a share. Veritas Capital executives said they expect no changes in management or employment would occur as a result of the acquisition. Subject to regulatory and Tech-Sym shareholder approval, the deal is expected to close in the third quarter.

NTIA, FCC Looking at UWB

WASHINGTON The National Telecommunications Information Administration has joined the FCC in looking at the possibilities of ultra-wide band spectrum. NTIA will study how ultra-wide-band devices could be authorized without interfering with other communications systems, including

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DIGITAL NEWS

Sirius Launches First Satellite

by Leslie Stimson

Sirius Satellite Radio has met what executives say is a significant milestone in its technology and business plans with the successful launch of its first satellite.

"The deployment of Sirius-1 means that within weeks we will be able to verify the fundamental capabilities of our system, including a coast-to-coast signal and digital-quality sound," said Sirius President/CEO David Margolese.

Executives from the other company developing satellite-delivered DAB technology for the United States, XM Satellite Radio, congratulated Sirius on the launch.

XM President/CEO Hugh Panero said the launch validates investor confidence in the technology by Wall Street. "The satellite radio industry is now moving from the capitalization to the execution phase," said Panero.

Lift-off

Sirius successfully launched the first of its three satellites on Friday, June 30.

Lift-off occurred at 6:08 p.m. Eastern from the Baikonur Cosmodrome launch site in Kazakhstan. The Central Asian launch site was a former Soviet spaceport.

Sirius is deploying its Space Systems/Loral satellites in an inclined elliptical orbit constellation with elevation angles of 60 degrees to 90 degrees over the continental United States.

Sirius claims the high elevation angles will ensure better reception for its satellite-delivered DAB programming.

Sirius plans to launch and test the other two satellites by November. Sirius' 100 channels of satellite-delivered DAB programming are due to be operational by the end of this year and XM plans to begin operations in mid 2001.

Panero said over the next 7 months, four more satellites will be launched (two from XM and two more from Sirius).

Photo courtesy of International Launch Services

Sirius-1 launched from Kazakhstan

PRSS

▶ Continued from page 1

Moderated by Scott Bridgewater, manager of NPR Distribution and Information Services, the session featured Jim Paluzzi, general manager of KBSU-FM in Boise, Idaho, chairman of the Distribution and Interconnection committee and a member of the NPR board; and Pete Lowenstein, NPR vice president of distribution.

At the heart of PRSS' satellite distribution plans is its new agreement with PamAmSat Corp. that gives the PRSS three transponders on a new satellite, the Galaxy IV-R. The satellite was launched in April and began operating June 26.

On that day, PRSS migrated its services from Galaxy XI to Galaxy IV-R. PRSS said the outage time for each transponder was less than 3 minutes.

PanAmSat deal

The 10-year agreement with PanAmSat (**RW**, March 1) gives the system a "space segment" for the decade, with backups in place should a repeat of the May 1998 failure take place.

Just a few years ago, the Public Radio Satellite System was planning for a slow evolution to a new satellite distribution system. In the fall of 1997, strategic planning was underway to plan for the replacement of the Galaxy IV satellite and the lease agreements that went with it in the early 2000s.

But Galaxy IV failed in orbit on May 19, 1998. Emergency measures restored service, but when the Galaxy IV permanent replacement was ready, agreements for the replacement satellite would have had to be in place, several years earlier than PRSS had expected to replace its satellite.

Under the new agreement, NPR has leased three C-band transponders on Galaxy IV-R. The 108 MHz of C-Band spectrum will be used for all PRSS services with room to grow. The addition of a third transponder provides additional capacity, and will allow the system to begin adding new services.

The next step is refurbishment of the earth terminals at member stations. The PRSS has 22 uplinks and 425 downlink terminals. Each site is being evaluated to make sure it can access the new capabilities of the system, as well as being ready to use the new backup facilities.

Not all sites need work, but some sites are still using their original antennas installed in the 1970s.

The PRSS sent survey requests to all connected stations, and responses could be completed over the World Wide Web at *www.prss.org/Es_survey/index.htm* The survey portion of the site is password-protected. Replies were expected by mid-July.

NPR believes it should take about two months to analyze the information. PRSS then plans to consult with stations to identify opportunities where modifications to local sites could improve local access and capabilities.

In general, the types of modifications contemplated would provide interconnected stations with access to the three public radio transponders and improve the ability of local antennas to point to the satellite backup locations contracted for in the new transponder agreement.

Looking forward, Lowenstein said, the additional capacity allows new and old services to co-exist. New services can be adopted slowly without converting all the earth terminals at the same time.

Jim Paluzzi, chair of the Distribution and Interconnection Committee, said that while the system evolves, it still must support existing users and give new options to producers and stations. It must remain the most cost-effective and reliable means to do the job.

Thinking about future ways public radio programming may be distributed, panelists discussed a recent event, nicknamed the "Great Minds Retreat," organized by NPR Distribution.

At the meeting, leaders from outside the public radio industry gave their insight into the future of program distribution.

Bandwidth issues

Experts understand that wireless, satellite and Internet technologies are converging. But only recently have participants begun to consider how these technologies could be adapted for public radio.

Audio streaming experts have discovered that the Internet is not well-suited for broadcasting. Bandwidth costs at the sending station are high, and backbone network congestion can make the audio sub-standard.

One idea panelists discussed is the possibility of using the new PRSS satellite capacity to help stations provide clean Internet audio.

For example, if each station sent a stream of audio to a single location, the streams could be multiplexed and sent by satellite to ISPs and then on to the user.

The programs could be a station's regular programs, or perhaps specialty programming. With the path from the local ISP to the customer the only link, the problems of network congestion could be bypassed.

All possible future uses have to be worked out with content providers and stations, panelists said. But with the future satellite capacity secured, "outside-the-box" ideas could be considered and developed.

RW News Editor/Washington Bureau Chief Leslie Stimson contributed to this article.

Top Engineers to Headline Session

Headed for San Francisco next month?

If you plan to attend The NAB Radio Show, book an early flight and mark your calendar to attend a high-powered panel.

NAB has asked me to moderate "Management Tips From Experts," which kicks off the sessions at 9 a.m. Wednesday morning, Sept. 20. It's part of the engineering track, but anyone interested in how radio groups and stations manage technical issues should come.

My thinking is this: We always see the owners and top CEOs meet for "summit sessions" at conferences. These panels are popular. The big boys and girls sit around and talk about the high-level issues, and we in the audience get a rare insight into their jobs and the decisions they make.

Why not do the same for radio engineering?

★ ★ ★

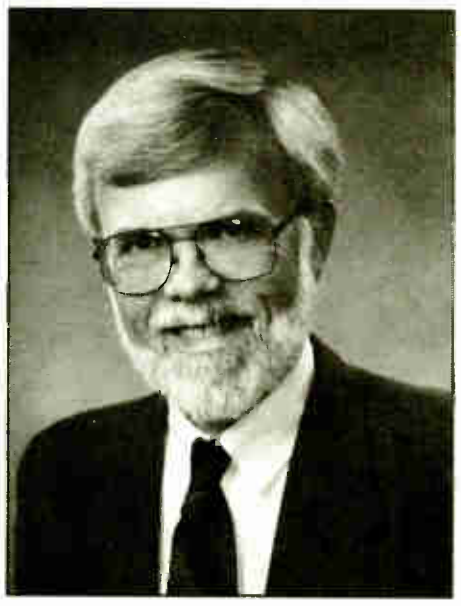
My goal is to provide a roundtable of outstanding professionals to discuss the challenges of technical management. I'll share the microphone with the audience, in an informal, give-and-take environment in which we can all ask questions.

The panel is still shaping up. But at this writing the following four gentlemen have confirmed, and I have several more up my sleeve.

We have Andy Butler, senior director of engineering for the Public Broadcasting Service. Andy is the current president of the SBE and one of the most incisive thinkers in our business.

Charlie Morgan is chairman of the National Radio Systems Committee and a long-time engineering executive for Susquehanna Radio Corp. In his work with the NRSC, he touches on virtually every technical radio standards issue, including the future of digital radio.

Frank McCoy is vice president of engineering for American Media Services and a former technical executive with Capstar and AMFM. He led a "Tech Trek" through Gulfstar stations and wrote about what he learned in **RW**. McCoy is full of ideas and has a special interest in how computer technology is used in radio.



Andy Butler

Barry Thomas is director of engineering of Comedy World Inc., a new media company based in Marina Del Rey, Calif., broadcasting on the Internet. He has been involved with radio since 1979 and has designed, constructed and operated facilities for Evergreen/Chancellor/AMFM Inc., OmniAmerica Group and others.

He is national secretary of the SBE and has a good perspective on the cross-platform issues of radio and the Web.

That's an exciting start. For the latest list of confirmed panelists, visit *www.nab.org/conventions/radio2000/*

★ ★ ★

For years I've loved sitting down like this with engineers and shooting the breeze about their jobs and their careers. I never fail to walk away with new information and new insights (as well as some great story ideas).

And my experience has been that engineers are more open about information than managers of other departments. Rare is the owner or PD who picks up the phone to offer assistance to a cross-town competitor, but engineers do that kind of thing all the time. So their conversations tend to be free flowing and educational.

My job as editor of a popular trade publication means I get that opportunity more often than many readers might. I am fortunate; I have an excuse to call up the officers of the SBE or the NRSC or the heads of large engineering departments, if I want to chat.

So here's *your* chance. Come prepared with a cup of coffee and your questions. We'll have a blast.

Some questions we might cover:

High-paying jobs and better hours are luring many people away from radio. How do you build a staff in this environment?

How do you keep qualified technical people? How do you justify staying in the business yourself in this era of high-paying PCS and computer gigs?

What are the biggest facility challenges faced by group managers? How does your department interact with MIS people?

Frank McCoy

From the Editor

Paul J. McLane

What role does certification play today? What management nightmares have you dealt with, what successes can you share?

How do you prove to management that you have the skills to help them grow? If you are non-technical, how can you work more effectively with the thinning ranks of radio engineers?

IBOC, satellite, digital technology, the latest audio processors — what are the most important management questions facing radio managers today?

I like our Wednesday morning slot because the exhibit floor is not yet open, so engineers, managers and owners can attend. For that matter, exhibitors can take a break from booth setup and sit in.

But if you plan to arrive in town on Wednesday, you'll miss this one. So come a day earlier and be part of the fun.

We'll publish a full rundown on the sessions and exhibits of The NAB Radio Show in our Sept. 13 issue.

★ ★ ★

Barry Thomas is also among the engineers who talked to **RW** for our story on page 10 of this issue about the future of the profession and the challenges of recruiting new talent.

I'd like to hear from you on these topics or any subject we cover in the pages of your newspaper.

Write to me via e-mail at *radioworld@imaspub.com*

GUEST COMMENTARY

AM Isn't Bad — Its Receivers Are

by Scott Todd

Broadcast Technician Scott Todd submitted the following petition to the FCC regarding mandatory AM receiver standards.

The petition was inspired by a Guest Commentary by Larry Langford, owner and chief engineer at WGTO(AM), Cassopolis, Mich., that appeared in RW's March 1 issue.

Langford was concerned that low-power FM would hurt small operations and that the commission could have helped by mandating AM receiver standards.

Scott Todd

This is a call to all small AM broadcasters to start a collective yell toward the FCC for better AM receivers, just as the UHF television industry had to do a number of times for better UHF tuners in TV sets.

AM has its limitations, but isn't so inferior to FM that much of the general public should be allowed to dismiss AM listening as an option.

AM has its limitations, but isn't so inferior to FM that much of the public should be allowed to dismiss AM listening as an option.

'Just around the corner ... '

As for those AM music stations that have not converted to stereo because "digital is just around the corner," I hope you are enjoying the wait! It won't be over nearly as soon as you think.

Now come the petitioners, a group of AM broadcasters, electronics professionals and discerning AM listeners, seeking action on a continuing problem for the nation's oldest broadcast service *(www.amstereoradio.com)*.

While moves are being made to implement a digital broadcast service that may allow high-quality transmission by AM stations using in-band, on-channel digital audio broadcasting, this service is many years away at best and has not yet proven to be viable.

We propose to improve current reception of AM stations to dramatically enhance the perceived quality of AM broadcasting.

In the mid-1980s, Robert Orban and Associates conducted an exhaustive study of many AM radios available in North America. The study found the upper audio limit delivered by these radios to be approximately 3 kHz. This is only slightly better than audio that is considered acceptable for speech transmission by telephone.

The makers of AM radios, when asked the reason for this narrow audio band pass, repeatedly blamed then-current FCC allocations rules, which allowed close spacing of AM stations with occupied bandwidth of up to 30 kHz.

RF could cause adjacent stations to give each other unacceptable interference in most receivers if they were built for bandwidth of even 15 kHz RF when used in all but high-signal areas.

To its credit, the National Radio Systems Committee proposed a standard transmission response with a sharp radio cutoff at just less than 10 kHz, proceeded by a standard pre-emphasis curve. This standard was designed to allow the radio manufacturers to increase receiver bandwidth while lowering the received interference from first-adjacent stations in low-signal areas.

In its wisdom, the FCC adopted these standards as mandatory for AM broadcasters. Compliance has been excellent.

Despite this implementation, we have seen only token movement in the receiver industry to adopt the new NRSC standard. It is our belief that AM radio can be improved at very low cost, but makers of AM radios claim there is no public demand for improvement.

We believe the public has come to assume that AM is inherently inferior and does not know what AM can sound like on a properly designed receiver.

Historically, the FCC has stepped in to force improvements in broadcast receivers to reflect the current state of the art. This includes the FCC mandating FM stereo in most FM receivers starting back in the mid 1960s.

The commission also addressed the then-frail UHF television industry by mandating television receivers be equipped with built-in UHF tuners, and by mandating various improvements in those tuners in the ensuing decades.

In the case of the expanded AM band, the FCC has required that stations going to the expanded band operate in stereo. However the FCC did not require radios built for the expanded band to receive stereo — another missed chance for overall improvement.

We, the undersigned, are asking the FCC to make mandatory changes that will have only minimum impact on receiver cost, but will dramatically improve AM performance, allowing AM stations to better serve the public need while we all await the start of digital service.

New standards

The new standards would in no way hinder the implementation of digital since no change is required in the transmission portion of the signal.

The vast majority of AM radios sold in the United States are built from a small number of integrated circuit modules provided by key makers such as Motorola.

The companies making these "building-block" circuits could easily address any mandatory changes ordered by the FCC. The companies that assemble and market these radios could implement the changes quickly.

With the latest digital signal processing demodulation technology, such as the latest generation of satellite-capable auto radio, these standards may be programmed into the digital signal-processing chip (not adding additional chips), which would keep manufacturing costs down.

To be correct, we must acknowledge that some companies do offer improved AM radios at this time proving that it is technically and economically possible. Such radios can be found in American cars as options in high-performance sound systems, or in the General Electric Superadio portable.

We propose the following minimum technical standards be required for all radios made for sale in the United States, starting as soon as the commission can act:

- All radios that provide FM stereo reception shall also provide AM stereo using the accepted standard C-QUAM system which has become the *de facto* world standard;
- The audio response of the AM section shall reflect the NRSC receiver standard that complements the now-standard NRSC transmission model. This standard provides for a reasonably flat response to 7.5 kHz;
- Function switches should perform the same duty for AM as well as FM, where applicable;
- In the event the commission allows for some instances, such as cheaper analog-tuned radios (in which the FM can be stereo and the AM remains mono), units must be labeled FM stereo/AM mono. Ambiguous phrases such as AM/FM stereo or FM/AM stereo should not be allowed under the rules of truth in advertising, as they may confuse the consumer into thinking a radio has AM stereo when in fact it does not. Radios with AM stereo should be clearly labeled FM stereo/AM stereo.

We believe it is against the public interest to require AM stations to transmit to a standard that was designed to allow increased performance and therefore better use of spectrum and then not mandate that receivers be made to take advantage of the resulting improvement potential.

While the commission requires minimum standards for FM receivers and television receivers, it has been silent on standards for the service that has been the backbone of commercial broadcasting for over 80 years. With increased competition from new forms of mass media such as low-power FM, satellite-delivered digital audio broadcasting and the Internet, it may mean the very existence for numerous

See COMMENTARY, page 8 ▶

IBOC

▶ Continued from page 1

Shortly, USA Digital Radio Inc. and Lucent Digital Radio Inc. can act on their plans to merge both companies into one new private company, to be called iBiquity Digital Corp. The deal, subject to antitrust review, was expected to close between 30 and 60 calendar days after the announcement, roughly Aug. 10 to Sept. 9.

The name iBiquity comes from the word ubiquitous and resembles the iDAB brand logo that USADR has adopted for IBOC-compatible equipment.

"It's encouraging that these two companies are combining resources to develop terrestrial digital quality radio for the consuming public," said NAB President/CEO Eddie Fritts.

Jim Woods, formerly VP of the radio division and now VP/GM of Harris Automation, said of the proposed merger, "It's a very positive development."

For all equipment manufacturers in general, he said, "It removes the risk of making the R&D investment."

When the deal closes, all of the alliances formed between equipment manufacturers and USADR and LDR separately will transfer to the new entity.

Harris, a former USADR investor and a backer of iBiquity, was among industry leaders that have called for an alliance between the companies for more than a year.

The companies took pains to present the merger announcement as a meeting of equals. Following the deal's closing, Struble and LDR President/CEO Suren Pai will become co-chairmen of the board. Struble will lead iBiquity Digital as its president/CEO.

Both men will have offices in their former competitor's location, they said.

Executives said the respective labs and offices of both USADR and LDR would be retained, as would all employees. In fact, both said the new company would need to hire more people to bring the technology to market, including engineers with broadcasting or computer expertise initially, and later, employees with other skills.

While not specifying specific personnel changes, Struble and Pai said the management team of iBiquity would comprise senior executives from both staffs.

"Together our organizations represent the best in technical skills and marketplace understanding. iBiquity Digital will change how the public uses, thinks of and benefits from radio," said Struble.

Pai said the proposed merger is a "watershed development" that will allow the new entity "to expedite the standard-setting process by offering the FCC and consumer electronics and broadcast equipment manufacturers the best technology available as the U.S. standard for digital radio broadcasting."

The boards of directors of both companies and the respective shareholders have approved the merger. Shareholders that backed each will own a stake in iBiquity. Lucent Technologies will be the largest shareholder in iBiquity, followed by Viacom, which is majority owner of CBS.

Several sources said that, faced with the prospect of one or neither company winning licensing money from IBOC development, the proponents opted for expediency and agreed to merge.

Other observers believe the decision to end the earlier alliance between the two companies was part of a necessary development process — advancement through competition.

Best of the best

Now each company can contribute the best of their work to a combined system, without fighting over future licensing, these sources said.

While those involved in the deal were glowing, some observers noted IBOC's 10-year development history and greeted the news with a note of caution.

"This is the equivalent of the Grand Alliance," said Consumer Electronics Association President/CEO Gary Shapiro, referring to the digital TV transition. CEA members include receiver manufacturers.

While the announced merger is a "major step," Shapiro said, whatever system iBiquity develops must be tested.

"We're not saying this is an acceptable system. It still has to be proven."

The leaders of the standards-setting National Radio Systems Committee said much the same thing (see story, page 7.)

Among those watching to see how the merger plays out are DAB proponents abroad. Digital radio is at various levels of rollout in other countries, but few conversations about the future of global DAB fail to raise the question of what the U.S. will do.

USADR had previously signed an agreement with Digital Radio Mondiale to develop an IBOC system for AM and shortwave that would eventually become a worldwide standard.

Executives of the new entity, iBiquity, still hope to expand the market for IBOC beyond U.S. borders — even to countries that use the Eureka 147 system of DAB.

When asked about this prospect, Julie Unsworth, project manager for the WorldDAB Forum, said she did not believe the IBOC merger would have a big impact on the rollout abroad.

"EU 147 is already quite well established now and it is market-ready with many different receiver types available ... in Europe and in Singapore and Canada."

Although receiver prices are still high, she said, they're beginning to drop and does not believe countries that have already invested in the Eureka 147 technology would switch to IBOC.

Combined Receivers, PDAs in IBOC Future

by Leslie Stimson

Once USA Digital Radio Inc. and Lucent Digital Radio Inc. finalize their merger, they must decide how to combine the best of each of their technologies in order to develop a single IBOC standard.

"We believe next year, 2001, you'll see a large number of radio stations making conversions," said Robert Struble, USA Digital Radio president/CEO, who will have the same role in the new iBiquity Digital Corp.

"We will be in the commercial mode next year, with receivers out late next year or in early 2002."

The fact that two former competitors have pledged to combine efforts will make it easier for receiver manufacturers to commit product lines, said Consumer Electronics Association President/CEO Gary Shapiro. He predicts more announcements of receiver manufacturers signing on to IBOC in the next year.

At the same time, he stressed manufacturers would like to see the test results. "Show me the money," said Shapiro.

Gene Kelsey, VP and GM of Panasonic Audio, sees opportunities to target new customers or expand his company's customer base in car audio.

The typical aftermarket car audio customer is a male, aged 16 to 24. Panasonic, through alliances with USADR and Sirius Satellite Radio, hopes IBOC and satellite-delivered DAB will attract customers outside that age range.

Struble and Suren Pai, LDR president/CEO, said part of the long-term vision for iBiquity is to develop combined AMFM, IBOC and SDARS receivers. But Struble said this would not be possible in the first generation of receivers.

Developing such a combined receiver would certainly be made easier through the use of Lucent's Perceptual Audio Coder compression algorithm technology. Lucent Digital Radio has an agreement with XM Satellite Radio to develop PAC for a satellite radio receiver. All previous equipment alliances carry over to the new iBiquity Digital.

One technical decision revealed so far is that iBiquity will use PAC in its combined USADR/LDR system. Other technical decisions will include whether to use multistreaming or blend-to-analog as a back-up channel, channel processing decisions and auxiliary data rates.

iBiquity plans new uses for its IBOC technology in wireless applications for mobile portable devices or so-called personal digital assistants.

The IBOC technology would be placed on a chip or a set of chips, which would be shrunk and could receive AM and FM signals and decode down the bit stream.

"With telecom service providers," Pai said, "our view is that over time, you'll see not just stand-alone broadcast receivers but receivers that can be integrated into a portable entity, such as a telephone."

Meanwhile RF equipment manufacturers face the challenges of adapting their equipment to accommodate the final version of the IBOC waveform.

Jim Woods, formerly VP of the Harris radio division and now VP/GM of Harris Automation, said IBOC transmitter costs and the costs of associated equipment would depend on several factors.

An AM transmitter would not cost a lot more, said Woods. But the modulator needed could cost from $15,000 to $50,000. Harris is still developing IBOC AM modulators, he said.

NRSC Praises Merger

by Leslie Stimson

Leaders of the standards-setting National Radio Systems Committee hailed the proposed merger of Lucent Digital Radio and USA Digital Radio.

"The members expressed unanimous support and thanks to USADR and to LDR for joining forces to bring IBOC DAB to the public at the earliest possible date," said NRSC Chairman Charles Morgan.

"It's certainly been a difficult undertaking and I'm optimistic we're almost there," said DAB Subcommittee Chairman Milford Smith.

Joint body

The NRSC is a joint body overseen by NAB and the Consumer Electronics Association to represent all facets of the broadcasting industry.

Executives of iBiquity still plan to be able to deliver a single, combined system to the NRSC and the FCC by the end of the year. The IBOC proponents and some equipment experts call that schedule aggressive, but said it can be done.

The FCC would not comment on its plans or the impact of the merger. FCC staffers continue to review more than 100 comments filed in a DAB Notice of Proposed Rule Making.

Before the merger announcement, RW asked FCC Chairman Bill Kennard what the FCC would do to expedite the IBOC rule process once there is a single standard.

"It's very much in our plans," said Kennard. "We need to make sure the broadcast industry moves from the analog to the digital age. We're going to do everything we can to facilitate that. It's not an easy question, though, because the IBOC technology is new. It's fair to say a lot of questions have not yet been resolved."

A source close to the FCC said some staff engineers continue to question whether a DAB system can really be developed for radio within the existing spectrum.

Morgan stressed that despite the merger announcement, the main goal of the NRSC remains the same: to determine if IBOC is reasonably better than analog AM and FM.

In a report issued by the NRSC at NAB2000, members said they were cautiously optimistic IBOC performs significantly better than analog, but they could not be sure because the proponents did not submit sufficient data.

What to test

In the 1999 tests, the proponents themselves largely decided what to test in 1999, based on recommendations from the NRSC. The next round of testing will consist of lab and field tests performed by independent third parties.

The NRSC must tweak some of its planned lab and field tests now that there will likely be one system to test for its performance against analog, rather than two competing systems.

As part of a formal standards-setting process, the NRSC planned to issue a Request for Proposals on Aug. 1, in case there are any other companies or individuals developing an IBOC system that have remained out of the limelight.

The NRSC anticipates a 45-day response period for the RFP.

If USADR and LDR have combined by the due date, they will submit a single Request for Proposal in their new form as iBiquity, said Morgan. If not, the companies will file separately.

DAB Subcommittee members were briefed on the announced merger at a meeting on Thursday, July 13. The next scheduled meeting is Sept. 20 at The NAB Radio Show.

◆ NEWSWATCH ◆

▶ Continued from page 2

conventional radio receivers.

NTIA plans to develop measurement procedures to determine whether UWB devices would interfere with receivers, including those for navigation and public safety.

The FCC also is considering permitting the operation of UWB devices (RW, June 21).

Gentner CEO Flood Honored

Gentner Communi-cations Corp. President/Chief Executive Officer Frances Flood has been named the Ernst & Young Entrepreneur of the Year in the Turnaround category.

Since assuming the role of president in 1997, Flood has led Gentner to 12 consecutive quarters of profitability. According to a company statement, she has "transitioned" the company from an invention-driven approach into a professionally managed organization focused on profitability.

Under her direction, revenues have nearly tripled while net income has increased nearly 800 percent. The effect can be seen in the price of Gentner stock, which has risen some 2,000 percent.

"More than anything else, this award recognizes the efforts of our dedicated employees," Flood said.

Flood and other regional award recipients will compete in one of several national Entrepreneur of the Year categories at the Ernst & Young EOY Conference awards gala in Palm Springs, Calif., in November.

ARMA Expo Photo Gallery

The American Radio Manufacturers Association drew 182 people to its Expo 2000 in Baltimore this summer, enough to justify another show next year, according to organizers. ARMA shows had been held in Atlantic City the previous two years.

Attendees responded to the Baltimore location and to the engineering-oriented program. Another draw was the concurrent meeting at the expo of three SBE chapters, from Baltimore, Washington and Ft. Meade, Md.

Exhibitors included Audemat Inc., Broadcasters General Store, Commercial Communication Associates Inc., Dalet Digital Media Systems USA, Gorman-Redlich Manufacturing Co., Klotz Digital America, LPB Communications, MediaTouch, Netia Digital Audio, Potomac Instruments Inc., QEI Corp., Radio Systems, Shively Labs, Studio Technology and Wheatstone.

Representatives of USA Digital Radio and XM Satellite Radio were among the featured speakers. Visitors came from New York, New Jersey, Pennsylvania, Maryland, Virginia and the District of Columbia.

— Paul J. McLane

At ARMA Expo 2000, Jo-Ann Dunn demonstrates a Radio Systems Millenium console to Fee Lee of Westwood One

The crowd queues for lunch. ARMA reported 182 people attended.

Ken Tankel of Dalet Digital Media Systems was a featured speaker. The company went public in France on June 23.

George Kuchmas, left, demonstrates LPB Communications gear, which now includes the Fidelipac and Dynamax brands. The manufacturer recently acquired the Fidelipac division of Amplifonix Inc.

Attendees visit the Netia Digital Audio booth

Robin and Vince Fiola organized ARMA Expo 2000. Vince Fiola is owner of Studio Technology, a custom furniture supplier.

Commentary

▶ Continued from page 5

struggling AM stations.

The author is a broadcast technician for Northwestern College Radio Network and a general class amateur radio operator, NOBST.

Reach him via e-mail at sat@nwc.edu

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

*In a letter to **RW** accompanying this submission, Todd wrote:*

I've been very pro-LPFM because it's all about helping the little guy. I've come to realize there are still quite a few little guys like Larry (Langford), and it was never my intention to hurt people like him, and felt it was time to lend a hand.

I'm also an AM stereo nut, and participate in a list-serve group of like-minded folks (*amstereo@listbot.com.*)

We perceived we had some common ground, so I wrote up a petition, and circulated it around the group, and then I passed it along to Larry. The final write up is mostly his, with the bulk of the co-petitioners coming from the list.

The petition was co-signed by 27 people, including Chris Cuff of Forestburgh, N.Y., a tireless AM stereo promoter, who puts a lot of his own money into buying radios for modification to be used as station giveaway/promotion prizes. He also builds AM stereo decoder boards.

Another co-signer, Darwin Long of Thousand Oaks, Calif., has challenged many a station manager with his well-reasoned letters.

Kevin Tekel of Warren, N.J., has an AM stereo section on his Web site that includes MP3 clips of AM stereo stations at *www.geocities.com/kevtronics*

Alfredo Torrejon, of Hillsboro, Ore., has designed a low-power AM stereo transmitter. For an example, see *www.inetarena.com/~alfredot/exciter.html*

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The New Face of Engineering

Ken R.

Then: Each radio station had at least one staff engineer and perhaps an assistant. Many stations had numerous engineers on staff.

Now: Each group of stations has at least one engineer.

Or at least one on call.

Deregulation wrought changes in every area of radio, from programming to ad sales. Engineering is no exception.

Keeping good people

The questions are among the thorniest in in radio engineering, arising at virtually every industry convention and on every chat group:

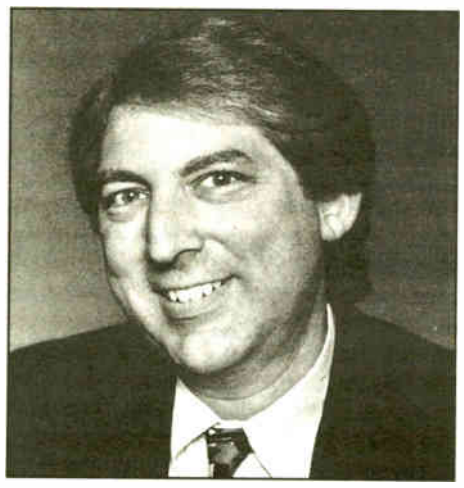
How will corporate owners keep good people in the face of the upheaval? Where will we get promising new talent?

"It is the nature of people in the engineering business that they want to serve, but I think some of these contract guys may be stretching themselves too thin," said Barry Thomas, national secretary for the Society of Broadcast Engineers.

"And we may be our own worst enemies. By helping station groups shore up their bottom line, we may be doing so at our own expense."

It is no secret that many talented people have left careers in broadcast engineering for fields such as information technology and the Internet. The people who remain have had to adapt, learn new skills, juggle compounded responsibilities and become more self-sufficient.

Atypically, Jack Schaffer came to broadcast engineering from the world of computers.



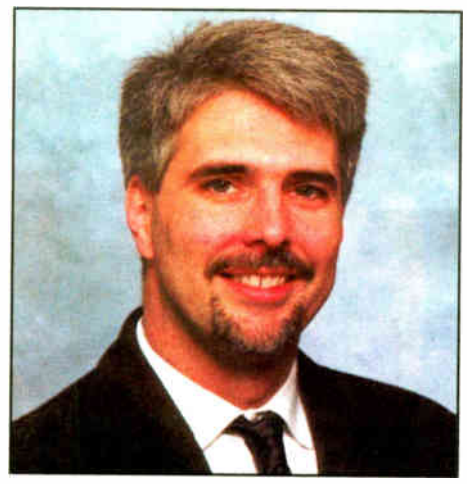
Bob Hess

"I didn't like the changes in that industry so I came to radio which is more individually challenging," said Schaffer. "I am currently working for four broadcast groups, about 18 stations in all."

Schaffer is under contract to Clear Channel Communications, Tele-Media, Anastos and Alive Ministries. He also works on an "as-needed" basis for Bradmark Communications. All of these properties are in eastern New York.

"There are no secrets between stations like there used to be," said Schaffer. "There are four of us engineers in the market and we cover for each other. If I didn't have those other guys to call on, I'd never get a vacation."

One of Schaffer's employers is Don Heckman, president and owner of Bradmark Communications.



Barry Thomas

"After you're in a market for a while, you learn that there are certain guys who are very reliable," said Heckman. "You try for a long-term contract if you can work it out. But what's happening is that the good engineers are getting gobbled up by the big companies."

The changes in the industry have also had an impact on suppliers.

"It's harder to get hold of the chiefs now," said Steve Paulson, national sales manager of Harris Corp. Broadcast Systems Division. "They are busier and have less time to chat about new products. But when they need to buy, they make themselves available."

Now that one person can speak for many stations, Paulson said, it increases the importance of good relationships.

Wayne Reese

we got a good response," he said.

Hess reported that he donated an old Pacific Recorders BMX board to WHHB(FM), a local high school station.

"The kids totally rebuilt the board and one of the seniors, Michael Simpson, became an intern at CBS," said Hess. "He wants to go into broadcast, he has a good head on his shoulders."

But for every story of a young potential engineer are several about people drawn away from the industry.

"Experienced broadcast engineers are becoming a dying breed," said Thomas.

Hess said, "Right now, all the young kids, including my son, are going into the computer field.

"It's difficult for radio to offer a kid just out of a two-year technical school the kind of money he can make in computers. Our industry has to face the law of supply and demand. As engineers go away, the industry will wake up."

The SBE Youth Membership program has been running since about the fall of 1998, said Angel Bates, SBE membership services coordinator. "There are 22 high school students participating at this time."

This program is open to young men and women in grades 9 through 12. Dues are $10 yearly.

Recruiting new talent

Wayne Reese is president of Munn-Reese Inc. Consultants. He said he also finds it difficult to recruit new talent.

"After deregulation eliminated the requirement to have an engineer at each station, everything changed," said Reese. "That used to be the training ground for consultants like us, but now there aren't as many new people going into the business."

We might end up looking among the LPFM or pirate crowd for people with technical skills.

— Barry Thomas

Reese tried to hire someone recently and found that there are insufficient numbers of qualified applicants coming out of the colleges to fill these positions, "because radio just can't pay enough," said Reese.

"We're looking for people with AM, FM and TV experience, but many of those people have become corporate engineers or contract engineers," said Reese.

"Even the few young people available don't have enough practical experience with frequency allocation, transmitters and

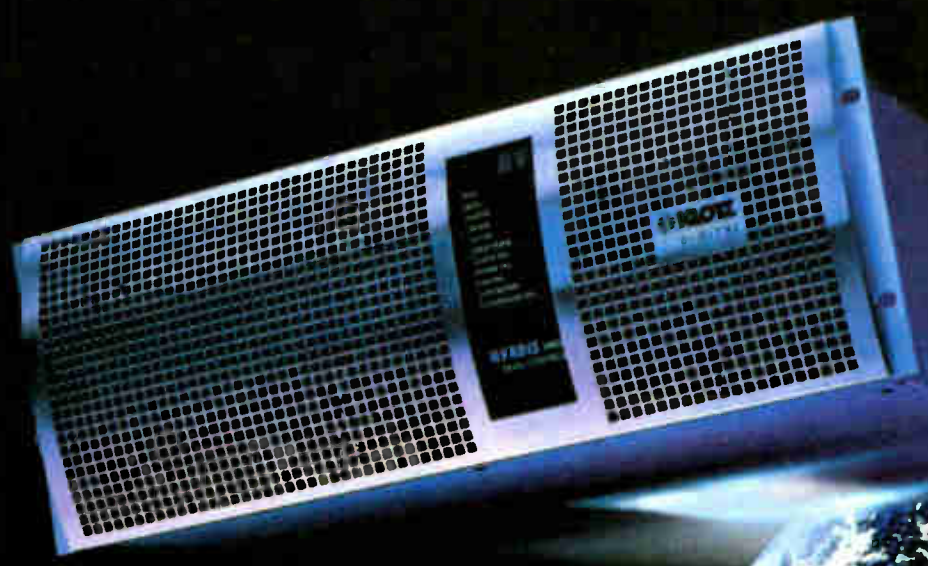
"It seems that sometimes it's the engineer's job to get things fixed, yet production guys know more about a lot of the equipment," said Brady Scharp, product specialist at SADiE, a manufacturer based in Nashville, Tenn.

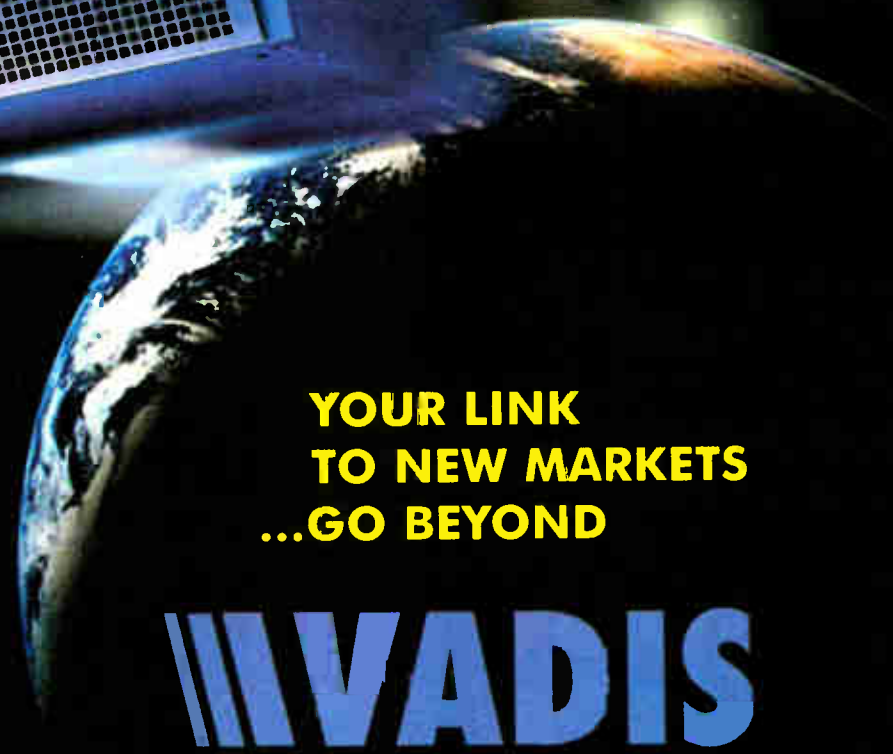
"The engineer may be able to take the basic hardware questions, but he isn't the one to talk to about the ins and outs of the software anymore."

"We have a number of kids around the country who have joined SBE through the Youth Membership Program," said Bob Hess, director of broadcast operations and engineering for CBS stations WODS(FM) and WBZ-AM-FM-TV in Boston.

"We've targeted every licensed high school radio station in the country and

See ENGINEERING, page 23 ▶





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ROOTS OF RADIO

Major Dial Changes for Clears

Mark Durenberger

This is the third in a series of articles about the history of clear-channel radio stations in the United States. The previous part appeared July 5.

When last we met, we reviewed early attempts on the part of full-service broadcasters to secure "super-power" authorization, and we looked at WLW's 500,000-watt Special Temporary Authority on 700 kc/s.

The requests for super-power were actually stimulated by the FCC's public comments, as they positioned for the North American Regional Broadcasting Agreement of 1941.

The goal of NARBA 1941 was "radio standardization throughout the Western Hemisphere." The planning for the conference began in the mid-1930s. The super-power positioning took place against the noisy backdrop of powerful "border blasters" operating out of Mexico and interfering with some U.S. broadcast signals.

The U.S. delegation wanted to reserve the ability to fight the border blasters with its own super-power arsenal if need be. They also had to balance the interests of powerful clear-channel broadcasters against Congress and the "have-nots" who saw super-power in the hands of the few as further undue media concentration.

The U.S. delegation went into the conference with a list of 25 frequencies they wanted protected for single-station use (including possible super-power), and they listed 21 additional 50-kilowatt channels that could be duplicated.

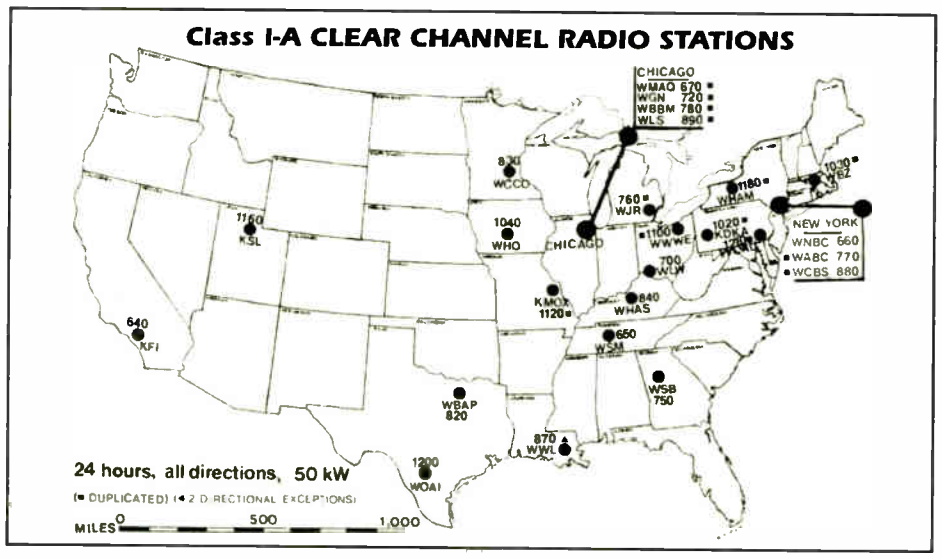

Fig. 1: 1-A stations under attack

For the first time, the labels 1-A and 1-B were officially applied to U.S. authorizations. 1-A stations were to continue operating nondirectional, with solo night-time assignments. The 1-B channels were to be occupied by two or more stations at 50 kW maximum, usually employing directional antennas to protect each other.

Interference from other countries would be accepted on the 1-Bs, even within U.S. borders. Interference protection for the 1-As was to be much more extensive, as we'll see.

In the interests of their own super-power stations, some member nations of NARBA pushed a curious turn of phrase into the final Agreement. That verbiage would be cited in the ensuing clear-channel discussions in this country.

Intriguing language

The NARBA language essentially stated that while 1-B stations were given a *maximum* authorized power of 50 kW, the 1-As would be authorized a *minimum* power of 50 kW.

In this respect, the *minimum* vocabulary the United States endorsed as a signatory to NARBA would differ from the FCC's own 50-kW *maximum* language.

In exchange for this subtlety, the United States gained a major concession from its neighbors. 1-A co-channel stations in adjoining countries could be located no closer than 650 miles from that country's common boundary with the United States. By geographical happenstance this language prohibited, with few exceptions, *any* co-channel operation on U.S. 1-A channels *anywhere* in North America.

When the delegates returned home, the United States had its continued protection on 25 1-A channels. To answer the demand for more frequencies, the United States agreed to an expansion of the band to 1600 kc/s. What was not resolved at the1941 NARBA was the U.S. position on super-power on those channels.

The great dial switch

To implement the NARBA changes, the United States participated in a major frequency re-shuffle.

On March 29, 1941, many of this country's AM stations moved to a new dial location, where they've been since. Most stations moved up the band, from 10 to 30 kc/s, but few did much to their plants, other than retuning and changing crystals. As a result, there exists today a number of stations whose towers are slightly longer than optimum for their present operating frequency!

Figure 2 below displays the channel changes for many of the high-power stations affected.

With the 1941 NARBA behind them, FCC staffers could now turn to the issue of providing reliable nighttime service to the country's "white areas." Attempts to build a record on the white area issue surfaced as early as an October 1936 FCC hearing, but it was on Feb. 20, 1945, that the FCC officially opened Docket 6741, looking into the future of clear channel broadcasting.

Thus began a struggle that was to last 35 years and put a lot of consultants' and attorneys' kids through college.

As it opened the clear-channel proceeding, the FCC requested industry input on the coverage issues. Industry advisory engineering committees met at length and reported out several ideas. First, they suggested there was a need for at least four national night-time services. But the committees also agreed it was impractical to deliver four solid nighttime services across the country with only four stations on four channels, and they suggested that some form of duplication *would* be needed. What was left to be resolved was how to get to that goal.

Super-power subsidization

The advisors also ventured into economic matters, arguing that super-power operation, while seemingly successful in other countries where it was usually subsidized, might not do well under the economic model of U.S. broadcasting.

It was suggested that the cost to cover

See CLEAR CHANNEL, page 16 ▶

NARBA RESHUFFLING OF 1-A STATIONS

Frequency	New class	New (former) station	Frequency	New class	New (former) station
640	1-A	KFI	1020	1-A	KDKA (KYW)
650	1-A	WSM	1030	1-B (later 1-A)	WBZ (CAN)
660	1-A	WEAF/WNBC	1040	1-A	WHO (WTIC/KRLD/KWJJ)
670	1-A	WMAQ	1050	MEX 1-A	(KNX)
680	1-B	KPO	1060	U.S.-MEX 1-B	(WBAL/WJAG)
700	1-A	WLW	1070	U.S.-CAN 1-B	KNX (KYW/WTAM)
710	1-B	WOR	1080	1-B	KRLD/WTIC/KWJJ
720	1-A	WGN			(WJAG/WBT)
740	CAN	CAN (WSB)	1090	U.S.-MEX 1-B	WBAL (KMOX)
750	1-A	WSB (WJR)	1100	1-A	KYW/WTAM
760	1-A	WJR (WJZ)	1110	1-B	WJAG/WBT
770	1-A	KOB/WJZ-WABC (WBBM)	1120	1-A	KMOX
780	1-A	WBBM	1130	U.S.-CAN 1-B	WDGY (KSL)
790	"Regional"	(KGO/KCMO/WGY)	1140	U.S.-MEX 1-B	
800	MEX	(WBAP/WFAA)	1150	"Regional"	(WHAM)
810	1-B	KGO/KCMO/WGY (WCCO)	1160	1-A	KSL (WOWO/WWVA)
820	1-A	WBAP/WFAA (WHAS)	1170	1-B	WWVA (WCAU-WGMP)
830	1-A	WCCO	1180	1-A	WHAM
840	1-A	WHAS			(KEX/KOB/WDGY/WINS)
850	1-B	(WWL)	1190	U.S.-MEX 1-B	KEX/WOWO (WOAI)
860	CAN 1-A	(WABC/WCBS)	1200	1-A	WOAI
870	1-A	WWL (WLS/WENR)	1210	1-A	WCAU-WGMP
880	1-A	WABC/WCBS	1500	1-B	KSTP/WSJV-WTOP
890	1-A	WLS/WENR	1510	1-B	KGA/WLAC/WMEX-WNRB
970	"Regional"		1520	1-B	KOMA/WKBW-WWKB
980	"Regional"	(KDKA)	1530	1-B	KFBK/WCKY-WSAI
990	CAN 1-A	(WBZ)	1540	1-B	KXEL/ZNS etc
1000	U.S.-MEX 1-B	(WHO)	1560	1-B	WQXR-WQEW/KNZR

Fig. 2

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FIRST PERSON

WETA: All-Synchronous Digital

A Public Radio Leader in the Nation's Capital Implements a Fully Digital Plant Design

Eric Hoehn

Public radio station WETA(FM), licensed to Washington, D.C., has just completed construction of an all-digital studio plant in nearby Arlington, Va. It uses synchronous AES distribution and routing.

Along with the testing of an IBOC system in which WETA is participating, it's possible for a signal to stay digital from intake into our plant all the way to the listener's receiver.

Why digital?

While television broadcasting has been quick to adopt digital distribution and routing, radio has taken a much slower adoption of the technology.

This most likely is due to small performance differences perceived by the listener for many changes. Radio stations have added digital technologies quickly when they clearly were superior to the analog technology being replaced.

Still, the audio console and the routing system at most stations have remained analog. Even moderately priced analog consoles have the features most radio stations need, with specifications that exceed the capabilities of the AM and FM transmission paths.

WETA moved from studios in which the previous consoles had been replaced in 1987.

Given that digital consoles and routing are becoming competitive with analog, a digital plant was deemed to have a longer future. Additionally, as more and more digital gear comes in to the facility, it will be simpler and less expensive to connect them if the plant infrastructure is digital.

Photos by Wolsch/Polara Photography

Most, if not all, digital facilities being built use asynchronous AES devices. The source gear, routers, mixers and other gear run on their own internal clocks and do not have a common reference.

Often this causes few problems, because most audio is fed through a console that has sample rate converters. Mixes go smoothly. In addition, the interconnection between control rooms may be analog, because only part of the facility may be digital.

This masks a problem that some stations are having as they get closer to the all-digital goal.

Even if all sources in a station are set to the same sample rate, the free-running clocks will all be at a different actual frequency. Even in the unusual case of two identical free-running clocks, their phase will be different.

This leads to periodic frame drops when two clocks "pass each other." This will show up as an audible glitch, yet it will not be repeatable by running the audio through again.

If the signals go directly to a console with SRCs on its inputs, this problem will be minimized; but then the console outputs will have the same problem.

Switching between one room's output and another will produce at least an audible click, even if the audio program is the same coming from each room.

WETA chose to build a synchronous facility to ensure that all of the AES gear would be locked to a common reference clock.

Common in television, a system of locking digital sources to a common source is still unusual in radio stations.

It does complicate studio construction. A reference source must be purchased, and distributed to all equipment. Because some gear requires an AES reference and other gear uses word clock, the situation gets worse. Finally, some new equipment still does not accept a reference, which is also hard to find in older gear.

WETA made a compromise, allowing free-running equipment to remain that way if connected directly to the sample rate-converted inputs on a console, but to synchronize sources that went elsewhere. Sample rate converters were installed on the station's satellite receivers and the outputs of the hard-drive storage system. This allows different control rooms, satellite channels and hard-drive outputs to be switched without audible pops.

Even though there is a cost to building a synchronous plant above connecting asynchronously, WETA has been pleased by the performance of the plant, and believes that most digital plants of the future will be synchronous.

WETA also broke from the trend toward using 110-ohm twisted pair for the digital audio. Distribution is all done with 75-ohm coaxial cable.

The reasons to go one way or the other depend on your station and use. In WETA's case, a co-located television station had a lot to do with the decision. At first, the new facility was going to use 110-ohm cable and just convert to coaxial cable when television interface was needed, but examination led us to use 75 cable throughout the plant.

The advantages for coaxial cable are:

- Quicker installation and termination. A BNC connector takes less time to put on.
- Cheaper installation. BNCs are less expensive than XLR connectors.
- Impedance consistency. Patch bays for 75-ohm signals have been around a long time for video, and they give a true 75-ohm connection into the megahertz. Conventional patch bays, even wired with 110-ohm cable, have enough capacitance to be an issue on longer runs.
- Equipment is becoming available to use 75 ohms without baluns. WETA's consoles and router were purchased with 75-ohm connections. Hopefully other manufacturers will offer 75-ohm connectivity as an option, or include both 110-ohm and 75-ohm connections on their gear.

But 75-ohm cable does have disadvantages.

- Baluns are still needed on some gear. This should change over time.
- The signal is low level and unbalanced. Care must be taken when constructing the plant to avoid ground loops. While not as noticeable as in an analog plant, ground loops make consistent performance harder to attain.

We use 75-ohm cable in the hope of avoiding obsolescence. As sample rates go up — and DVD audio is already raising them — 75-ohm cable with its wide bandwidth is less likely to need replacement.

These tradeoffs become even greater when we compare with a twisted-pair plant that is "stretching the rules."

See WETA, page 22 ▶

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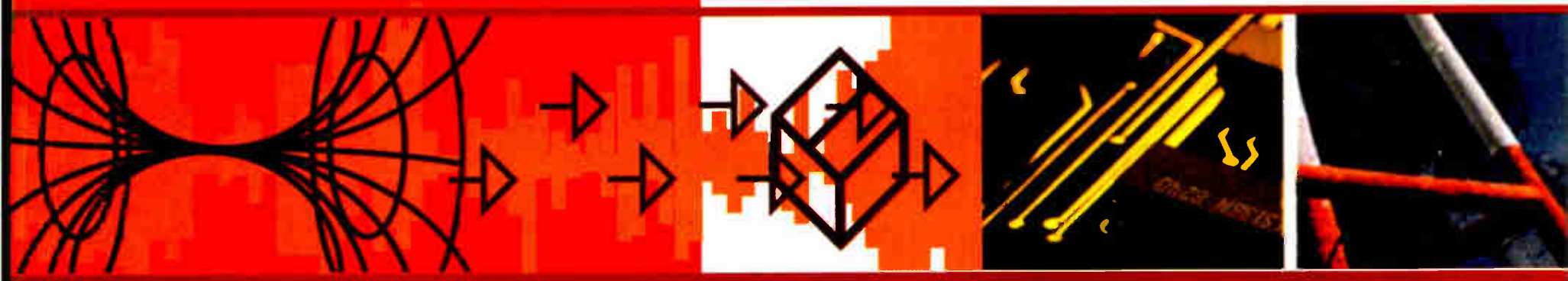

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Clear Channel

▶ Continued from page 12

wide areas of low population density might not be covered by the advertising dollars available in those areas. The report compared wide-area night-time sky-wave service to Rural Free Delivery, in which mail costs are borne primarily by the urban centers, and the costs of serving remote constituents are essentially subsidized. The committees concluded that primary operating support for super-power stations would have to come from "urban centers" where the stations would presumably have to be located.

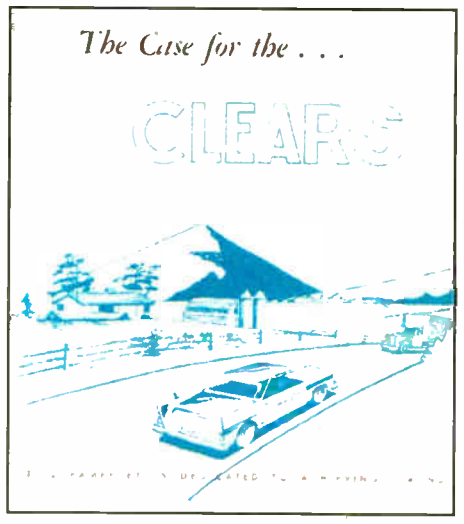
Looking at a U.S. map and applying some logic, one could conclude there might not be enough large "urban centers" in the sparsely-populated white areas to support super-power operation. Therefore, if cost-support *was* to be a driver, relocating super-power stations away from urban centers would not be the best approach.

That economic argument alone might have doomed the chances for super-power. For this reason and others, the FCC stayed focused on duplicating the clear channels. The commission was very clear in stating that the ultimate solution for white-area coverage had to meet one primary criterion: maximum population gain. (In fact, when later it began to authorize such duplicate assignments, it declined to name specific cities for the new signals but instead identified only the *states* in which such operations might be located.)

In the late 1940s and early 1950s, proposals on how to deal with the clears appeared with regularity. It is interesting to watch the disparate interests at play during this proceeding.

There were those who honestly saw a strong need for new service to white areas. Others were interested only in bringing about the dissolution of the 1-As. Both groups had sympathetic ears at the FCC.

Some of the commission's public statements during this period make fascinating reading, as you watch the FCC slowly move toward the politically comfortable position that "more stations are better for you." Our story will be served by scattered notes from the record, as the clear-channel docket was being assembled:



• In 1946 the FCC decided to allow "Daytimers" to operate on the 1-As, but *only* inside a 750-mile radius of the 1-A stations (the approximate 50/50 skywave contour). They reasoned that assignments outside that contour could preclude possible high-power operation or duplication on the channel.

In granting the Daytimers authorization to operate on the clear channels, the FCC enabled a breed of political fighters who got a taste of the action and who would exert a sometimes ill-advised influence on the coming battles.

• In 1948, CBS proposed that FM stations be taken into account in defining white-area service. CBS reminded the FCC that its own staff had reported that "new FM assignments will provide service to 500 new communities, in every state except Montana."

The goal of NARBA 1941 was 'radio standardization throughout the Western Hemisphere.'

The FCC wouldn't buy CBS's argument. They said, "Clear channels would always be needed for wide-area service, under any foreseeable developments affecting the wider utilization of FM radio."

It would be many years before the FCC would include FM in calculating radio coverage.

During this period, the FCC poked its toes into the water with a series of tentative "proposals." In 1958 the commission suggested adding new (Western-states) Class I stations on 660, 770, 880, 1100 and 1180.

The FCC also wanted new Class II assignments on 670, 720, 780, 890, 1020, 1120 and 1210 in areas "where they were needed."

The FCC made this proposal while at the same time suggesting that it would leave the other 1-As protected for higher-power operation.

It's small wonder that industry-watchers were becoming confused.

Next month: The beginning of the end?

■■■

Mark Durenberger is GM of Group W Network Services in Minneapolis and an occasional ***RW*** *contributor. He welcomes questions and comments about this series via e-mail to* durenberger@teleportmn.com

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Workbench

Radio World, August 2, 2000

Compact, Versatile Remote Kit

★ ★ ★

John Bisset

Chris Kelly is market chief for the Cumulus Salisbury properties. Chris put together a compact, versatile remote kit, shown in Figure 1. It includes a wireless microphone receiver, tuner and MD player that can be routed through a Crown amp.

Fig. 1: Chris Kelly's compact remote kit

To keep the wireless mic receiver diversity antennas from obstructing operating controls, Chris mounted the connectors to each side of the SKB case. The plastic extrusions on the case, shown in Figure 2, protect the RF connector from damage. The diversity antennas are easily screwed in place when the kit is set up.

The "rubber duckie" antenna seen in Figure 3 is connected to the FM receiver, and is also removable. Keeping the remote box simple should help free up engineering time, because you're not heading off to every remote to set up.

With all the other duties a chief engineer is handling these days, and in most cases for several stations, expecting him to handle remotes with no compensation is ludicrous! This is especially true when the talent is collecting several hundred dollars in talent fees, and the gross to the station may be several thousand dollars. No one wants the system not to work.

To give you an example of the importance of remotes to some stations, one engineer told me how he was instructed by the sales manager to *not* repair the station's transmitter. Instead, he was to set up a Friday afternoon drive time remote. Once the remote was on, *then* he could fix the transmitter. Go figure!

Fig. 2: Plastic extrusions protect the RF connector

Fig. 3: A rubber duckie antennna screws on to provide FM reception

Make sure you have a box of clean rags and a gallon or two of Isopropyl alcohol stored at the transmitter site, for some thorough cleaning. Some of the hardware stores stock an item called Rags in a Box. The box is packed with clean cloths or shop rags, and are ideal for cleaning transmitters. The price makes them throw-aways, and they don't leave little torn pieces behind like a paper towel does.

If you're in a large city, check the phone book for T-shirt companies. They always have scrap cotton shirt material for sale. This material is clean, torn or cut into hand-sized pieces, and is probably the cheapest you can find for cleaning and dusting.

Don't forget to promote your find to the general manager. Remember, he views

See WORKBENCH, page 20 ▶

Share your own remote experiences with us at *jbisset@harris.com*

★ ★ ★

The summer season always brings lightning problems, and sometimes repairs after a storm is the only time any real transmitter maintenance gets done.

◆ MARKETPLACE ◆

Products for the Radio Broadcast Professional

Mail info and photos to: RW Marketplace, P.O. Box 1214, Falls Church, VA 22041

Valcom Antenna Series Stand Free

Valcom Ltd. has introduced the V-33070 Series of free-standing fiberglass antennas, intended for AM broadcast applications.

"The free-standing antenna is a godsend to the AM station with limited tower real estate since no guy wires are required," said Valcom President Paul R. MacPherson."Maintenance is essentially cost-free because the coiled wire is encased in fiberglass."

For more information contact Valcom in Ontario at (519) 824-3220 or visit the company Web site at www.valcom-guelph.com

MastVoice Deployment Annunciator

Too often, we hear of a radio or TV reporter or engineer injured when a mast strikes a power line. MastVoice provides audible reminders of proper mast deployment techniques and the consequences of improper deployment.

This $825 device comes with a 4-inch internal speaker, external speaker interface and engineering test switch. It GPIs to your truck's mast activation system and repeats its messages until deployment is complete.

MastVoice comes with two pre-recorded messages. A Sonalert precedes the first voice announcement: "Look for overhead obstructions!" Thirty seconds later, a Sonalert precedes a second voice announcement: "If mast comes near power lines, you can be killed!"

The sequences repeat until deployment.

MastVoice will attach to any flat surface with four screws. The unit measures 7.5 by 6 inches. It does not have an off switch nor does it permit volume adjustment. It is triggered by a contact closure or +12 volts.

A wall transformer and custom announcements are available as options.

For information contact AVEC in Pennsylvania at (800) 845-7783 or send e-mail to avec@avecENG.com

Workbench

▶ Continued from page 19

you as a spending element of his station. Show that you are saving the station money. This will make you look good, and drive home your conscientiousness.

★ ★ ★

Joe Stack worked for the ABC stations for many years, and has maintained and repaired a number of transmitters during that time. He offers a couple of transmitter maintenance tips to consider when you're wiping down the inside of your rig.

Many transmitters have a calibration pot or rheostat for adjusting the filament meter reading. This is especially true if the filament voltage is read on a multimeter.

Keep in mind that tube filament voltage should be measured at the tube socket, with a meter of known accuracy. Keep in mind that this measurement is made with the tube in place, and no high voltage on — throw the HV breaker to make sure the transmitter doesn't come up.

After measuring and adjusting the filament voltage to the factory-recommended setting, adjust the calibration pot so the meter reads the exact voltage. Maintaining accurate filament voltage will extend tube life, since even a 0.1 volt inaccuracy can make a difference.

Another important measurement is to verify the exciter output power using an in-line wattmeter. Even though the transmitter input may not be purely resistive, this measurement will be a good benchmark, and tell you if the power meter on the exciter is reading properly.

Make your measurements into a dummy load, then measure into the transmitter, and keep these records in a maintenance notebook kept at the transmitter site. Remember that more power out of an exciter, to the point it overloads the transmitter input, is not good. Check what the manufacturer recommends.

★ ★ ★

While we're on the subject of the exciter, check the reflected power meter.

Most exciters provide this metering function. If the meter reads any appreciable reflected power, check the RF cable leading to the transmitter.

I found an exciter that was wired with 75-ohm video cable. It looked like 50-ohm cable, but only after finding the part number in a catalog did we see the characteristic impedance was not 50 ohms.

One of the most important points made at the NAB Transmitter Workshop is to not scrimp on your FM exciter. It goes without saying that this is where it all happens.

Connecting the exciter to the transmitter with a good grade of coaxial cable is just as important. Make sure you have the proper connectors, too. All BNC connectors are not created equal!

Even when the exciter is wired properly, there may still be a mismatch. Most transmitters have tuning and loading controls that facilitate matching the exciter to the transmitter input. They are adjusted for a minimum on the exciter reflected power meter. Some transmitters either lack these controls, or have a very short adjustment range. If you've adjusted the input match controls and can't reduce the mismatch, a manual manipulation of the tuned circuit may be required.

Not all 9V batteries are the same size, and may not fit in battery compartments

You can improve the match by gently bending, extending or shortening these wired components. Make your adjustments in very small increments, remembering to power down and discharge all components prior to each manipulation. It's a slow and tedious process, but the reduction in reflected power on the exciter and the resulting improved operation will make the effort worthwhile.

★ ★ ★

Always looking for a bargain? Buyer beware! That's the warning from Z-104 Chief Ed Bukont about discount batteries. Ed saw some unbelievably priced 9V batteries for use with his wireless mikes. Figuring a full season of remotes, Ed ordered a stash.

One small problem: the batteries were slightly larger than the "standard" 9V, and would not fit into the battery compartment of his wireless mikes.

As you can see in the photo, left, not all 9V batteries are created equal.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is a district sales manager for Harris Corp.

Reach him at (703) 323-8011.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or send e-mail to jbisset@harris.com

RADIO broadcast products

Arrakis Systems inc.
Condensed Catalog

1200 Console

- NEW - redesigned in 1999
- 5, 10, or 15 channel models
- Fully DC controlled for reliability
- Ultra high audio performance
- Easy connectorized installation
- Modular internal electronics
- Mix minus phone interface

A rugged design with heavy aluminum panels, solid oak trim, 5M operation On/Off switches and full DC control, the 1200 is ideal for On Air, Production, or News applications.

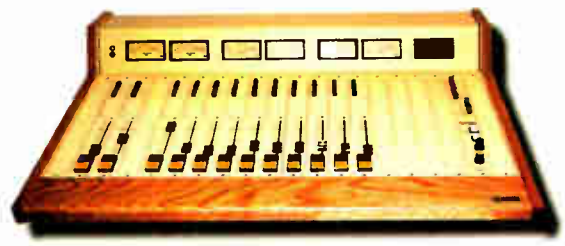
Standard Configurations

1200 - 5S	5 channels	$2,295
1200 - 10S	10 channels	$3,495
1200 - 15S	15 channels	$4,495

(call factory for options)

12,000 Console

- NEW - redesigned in 1999
- 8, 18, or 28 channel models
- Fully modular design
- 3 stereo output buses
- VCAs remove audio from faders
- Telephone talkshow module option
- Monitor for control room & 2 studios



Modular, reliable, flexible, and powerful, the 12,000 is found around the world from Tokyo to Paris to New York. The 12,000 is perfect for any size market or any radio application.

Standard Configurations

12K8 - 6	6 channels	$4,350
12K18 - 12	12 channels	$7,075
12K18 - 18	18 channels	$8,755

(call factory for options)

Digital Console

- NEW - Revolution Series
- Digital & Analog Radio Console
- Console, Touchscreen, or Mouse Control
- 3 Program & 2 Telephone Mix (-) outputs
- 12 CH, PC Control $3,995
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A breakthrough in features, performance, and price, this is a black box digital audio console controlled by a familiar Console -or- PC computer. Powerful, flexible, and designed for ease of use, installation, and service, the Revolution is a Colorado Digital Product.

Available April

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(800) 433-2105

BGS
(Broadcasters General Store)
(352) 622-7700

SCMS
(Southern Coastal Marketing)
(800) 438-6040

BRADLEY BROADCAST
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CONTINENTAL ELECTRONICS
(800) 733-5011

RF SPECIALITIES
(contact their regional offices)

For more complete information on any Arrakis product visit our website at:
www.arrakis-systems.com
-or-
email to:
sales@arrakis-systems.com

Other Products

Digital

Furniture

WETA

▶ Continued from page 14

Many users are not going with 110-ohm cable but with Category 5 LAN cable, nominally lower in impedance. Compounded with non-impedance matched terminal gear, these plants may have some problems in the future.

Remember that an AES signal will sound good until it fails. If the failure is due to excessive reflections in the plant wiring, it could be hard to find a fix. Something may work perfectly until one patch is added, and then everything stops working. Beware of skimping on the cable installation.

At this point many people say, "You're doing way too much. It's practically a video plant!"

If you look at the signals, you find that AES audio has a lot more in common with video than it does with analog audio. The signal only represents audio, it is not audio itself.

It has a timing reference, degrades in the presence of reflections and needs a bandwidth similar to video. It only switches properly at frame edges and will make the next device in the chain glitch and relock if a proper switch is not made. Because of the high frequencies involved, the cable runs are actually transmission lines, and proper termination assures low reflections.

Studio construction

We paid attention to ensure low-noise studios, because the day may be coming when the listener will have a receiver capable of far greater dynamic range.

If you are building a facility of this nature, ensure that your control-room space is isolated adequately from outside noise and from mechanical rooms, pumps and other noisy building systems.

Plan room for extra cabling to remote future PCs. The cooling fans for a modern PC are loud enough to affect air sound or production work.

Cybex or Black Box will be your friend in a new studio construction project.

Plan lighting to prevent glare off the monitors that inhabit the modern control room. Use of flat-panel displays seems to help, but there's no substitute for adjustable lighting.

WETA uses hard-drive storage, digital editing, e-mail, the Web, wire services and NPR's DACS system to operate.

That means a lot of remoted PCs just for the on-air operations. WETA installed the PC servers and workstations in a common equipment area, located one floor below the studios. Each PC goes to a Cybex PC Companion, a device that allows two keyboards, mice and monitors to be connected.

Production Suite B at WETA(FM). Studios were designed by Walters-Storyk Design Group.

One of these connections goes to the control room via a Cybex PC Extender, which lets the keyboard, mouse and monitor be located remotely over Category 5 cable. The other connection to the PC goes to a switcher in the equipment room so that all the PCs can be worked with.

You will find this of great benefit when updating software.

Additionally, in the production rooms, the PC SCSI bus was extended over a fiber link so CD recorder drives and tape mass storage drives can be located in the control rooms. This eliminates the need to take the blank CD, for example, and go to the actual PC chassis to load it.

We discovered that the video ground may not be carried with the Category 5 cable extender. The extender receiver uses a wall wart, so it does not provide ground. The extender is counting on your monitor to provide the ground connection.

If you use a flat panel that has a two-wire power cord, you will not have a video ground, and the extender will not work. A wire grounding the extender receiver to station ground will cure the problem.

The biggest lesson is to assume nothing. Check the specifications on every piece of equipment. Don't assume that it's easy to buy a particular product on short notice.

Check nominal operating levels of equipment at the time of purchase. Levels in AES audio are specified as the number of dB that the analog signal is below full-scale digital.

This is the point at which the system cannot represent a larger value digitally (all ones). Clipping distortion above this level is certain and often severe.

Many digital products today are specified for nominal level to be 20 dB below full-scale digital. This gives 20 dB headroom in the system.

During installation of the satellite receivers, we discovered that the reference level used in the satellite system is not adjustable, and did not conform to the rest of our facility. While everything else in the plant runs at the standard level of 20 dB below full-scale digital, the satellite system, which was put in several years ago, ran at -14 dBFS.

Thus all the satellite audio was 6 dB higher than everything else in the plant. The receivers are not adjustable, so the problem had to be dealt with elsewhere.

Our solution is to use sample rate converters to synchronize the signals with DSP level controls. Each satellite channel will be reduced 6 dB to match up with the rest of the plant.

About those sample rate converters. They were harder to purchase than we expected. WETA needed about 24 channels of sample rate conversion that would take the asynchronous signals from the satellite receivers and hard-drive storage and lock them to house reference, adjust the levels of the satellite receivers, and give about four outputs each.

The multiple outputs are important so that patches can be made without interrupting inputs to the router. Remember that bridging AES signals are not permitted in the standard. Although this is done frequently, problems with reflections can result due to the impedance bump.

The desired sample rate converters were not available from common sources. In the end, we used the first cards produced by one of the equipment manufacturers. While they have not been free of trouble, the company continues to work with us to get the bugs out.

EAS switching was hard to purchase. We found only one manufacturer of a two-input, one-output synchronous switch that also included an A-to-D converter on one of the inputs. Even the unit we are using required quite a bit of interfacing, because it expects RS-232 control and not the simple contact closure that the EAS equipment provides.

I suspect this will change because even an asynchronous air chain will need such a switch to do EAS. The system will need to make a synchronous switch to keep from making an audible pop on the air as an EAS transmission starts and ends.

Big surprise

A surprise happened with one piece of gear that split the AES output to carry one mono signal on Channel 1 of the AES stream, and a completely different signal on Channel 2. What are they thinking?! Unless the console or recorder you connect to can take single-channel audio and route it appropriately, it will cost you significantly to correct this. One can only hope that as time goes on, the manufacturers will learn as much as the stations.

Design of your digital plant also should include UPS backup for the digital gear. A single, large UPS may be a better choice than numerous small PC-type supplies. After working with a plant with upwards of 20 individual UPS units, it was discovered that after a few years, there was always a UPS with low batteries or some other problem. A single UPS is easier to test and maintain.

In late 1999, just after WETA moved into this facility, USA Digital Radio began tests of its IBOC system on WETA. The first tests were simple error rate testing and program loops. In October, full mobile testing was done, with the system operating in its hybrid mode.

WETA converted one of the Moseley STL 9003Q Studio Transmitter Links to carry one AES channel at 48 kHz, instead of two AES streams at 32 kHz. Unprocessed audio was sent over this link to the transmitter.

At the transmitter site, the AES audio went into separate processors for DAB and analog transmission, the analog audio was delayed to be in time sync with the digital broadcast, and testing began. The analog broadcast was a complete digital system through a Continental 802D exciter.

The digital system went into the USADR exciter, and then to a modified Harris Z-10 transmitter. The two RF signals were combined and sent to the antenna. The signal remained digital all the way to the receiver.

After conversion to analog for the amp and speakers, we heard audio that went all the way from the CD master to the tuner without analog stages.

The parts of the tests witnessed by WETA were quite encouraging.

In summary, the "perfect" performance of digital audio does not cover up for shortcuts in plant design, so all issues of power, grounding and physical construction are as important as ever.

Know your options and choose the ones that fit your plant. You may find that asynchronous digital audio on twisted pair is fine for you. But be aware that other choices exist.

Note: Since this article was originally written, TFT has introduced an EAS switch for digital air chains, and Ward Beck has completed the sample rate converters with level adjustments.

■■■

The author is chief engineer for radio at WETA(FM) in Washington, D.C.

Engineering

▶ Continued from page 10

directional AM antennas, for example."

Reese said that many people now in the industry are more oriented to computers than RF issues.

"The new computer equipment has helped stations cut their costs, but it's created a problem on the engineering side."

"If you don't have the drive and the heart ... if you don't have radio in your blood, you won't be attracted to broadcast," said Heckman. "You need to feel the thrill of going to work every day."

If you don't have the drive and the heart ... if you don't have radio in your blood, you won't be attracted to broadcast.

— Don Heckman

New thinking, new talent

"Some out-of-the-box thinking is needed when it comes to bringing new talent to our business," said Barry Thomas. "It may be heresy to say it, but we might end up looking among the LPFM or pirate crowd for people with technical skills."

Thomas feels the next crop of engineers will likely come from the Internet because the transmission skills will be all they lack.

"If they have audio skills and they understand show business, you can teach them the RF element," said Thomas.

"But there's one skill that doesn't translate from the Internet: the 'Mission Critical' attitude. Broadcast engineers must be keenly aware that their stations need to be on the air 24 hours a day, 365 days a year, and for Internet people it's not that important."

"It's frightening what the broadcast industry has done to demoralize engineers," said Thomas. "Engineers are getting burned out and broadcasters are lowering their technical standards because they want to run with smaller staffs."

Thomas cited the example of a top station in Los Angeles that is billing between $30 million and $45 million each year and is running with one engineer.

"It's up to the engineers to point out the cost of doing business to management. Owners are not doing it to us... we're *letting* them do it to us," said Thomas.

■ ■ ■

What should radio do to attract and retain qualified technical people? Tell us your ideas at radioworld@imaspub.com

Michael Simpson

Managers hopeful for a new generation of radio engineers will be encouraged by the experiences of Michael Simpson.

"I wanted to be a DJ at our high-school station, but I couldn't get a show the first year," he said. "That's when I started working with Jeff Richmond, our part-time station engineer. I liked the whole aspect of trying to find a problem and then fixing it."

Michael Simpson

Richmond, 18, an engineering consultant by profession, volunteers several days a month at the high-school station in Holliston, Mass., and serves as a mentor to the students.

"We have basically no budget at our station," said Simpson. "So we have to fix everything. The biggest thing I helped fix was an Optimod. It kept blowing power supplies until we finally discovered the problem was a teeny resistor in the voltage regulator that had blown."

The facilities at WHHB(FM) are anything but palatial.

"Picture a radio station from about 1985 and add a couple of CD players," said Simpson. "The whole thing consists of two small rooms in the library of the school."

After graduating, Simpson went from WHHB(FM) into an internship at WBZ-AM-FM-TV while enrolling in the Youth Membership Program of the Society of Broadcast Engineers. This fall he plans to attend the University of Colorado studying engineering, business and communications.

"Right now almost everything in radio involves some type of computer, and I like computers," said Simpson. "Radio gives me a chance to work with computers and electronics."

Simpson looks forward to a career in broadcast engineering, but knows that it's going to be a challenge.

"The way stations now share a single engineer can get very stressful," said Simpson. "If you're not really good at what you're doing, you're not going to be there for very long. I want to learn to develop a better work ethic so I can be a cut above the rest."

GM Journal

Radio World — Resource for Business, Programming & Sales — August 2, 2000

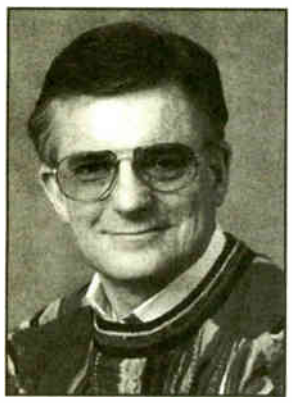
SME Mob Scene
Page 31

How Many Ads Decrease TSL?

Ken R.

"We'll be right back after this short break." But is it really a short break?

"Radio is a hot market right now," said Julie Pahutski, senior vice president of Empower MediaMarketing's knowledge, information and invention group.



Stuart Sharpe

"Especially with all the 'dot-com' advertising and a healthy economy, many stations are not only increasing their spot prices but also their available inventories."

Empower surveyed 16 markets to document the growth in commercials in these markets. The Empower report defined commercial units as paid advertisements which were 30 seconds or longer.

The radio commercial unit count grew by 13 percent overall between 1998 and 1999. The San Francisco-Oakland-San Jose market experienced the highest increase with a gain of 20 percent in commercial units.

Increase in clutter

"Radio is doing very well," said Pahutski, "but Arbitron found that between 30 and 40 percent of the listeners have noticed the increase in clutter.

"At the same time, we've seen a downtrend in time spent listening, but I can't be positive that the two factors are related."

Other markets that posted double-digit increases in spot loads include Miami-Fort Lauderdale, up 16 percent; Detroit, 12 percent; and Chicago, Philadelphia and Washington at 11 percent each.

Only two markets had a decrease in spot loads: San Antonio, Texas, (down seven percent) and Indianapolis (down two percent.), according to the Empower survey.

By radio format, alternative rock posted the biggest gains, according to the Empower survey.

"It's a growing audience, a growing number of stations, and the advertisers like the hipper listeners," said Pahutski.

Pahutski said the dot-com advertisers in particular find this radio market segment attractive.

The smallest increase in spot loads was seen in the country format, according to the Empower survey.

"I always ask a station how many units it allows each hour," said Marlene Kruelle, senior media buyer at advertising agency BBDO, Atlanta. "I look for 12 to 14 units, but if I hear 14 to 16 my eyes pop out."

Kruelle said that above 14 units, time spent listening may deteriorate.

"I will use a high spot load as a tie-breaker if I'm considering two stations with similar cost per point," said Kruelle.

See CLUTTER, page 26 ▶

Photo by Robert Glutz Photography

Julie Pahutski

MANAGEMENT CORNER

Where Your Listeners Are: The Net

Vincent M. Ditingo

There seems to be little doubt among an increasing number of station managers and marketers that digital PC technology has rewritten the rules of the radio business.

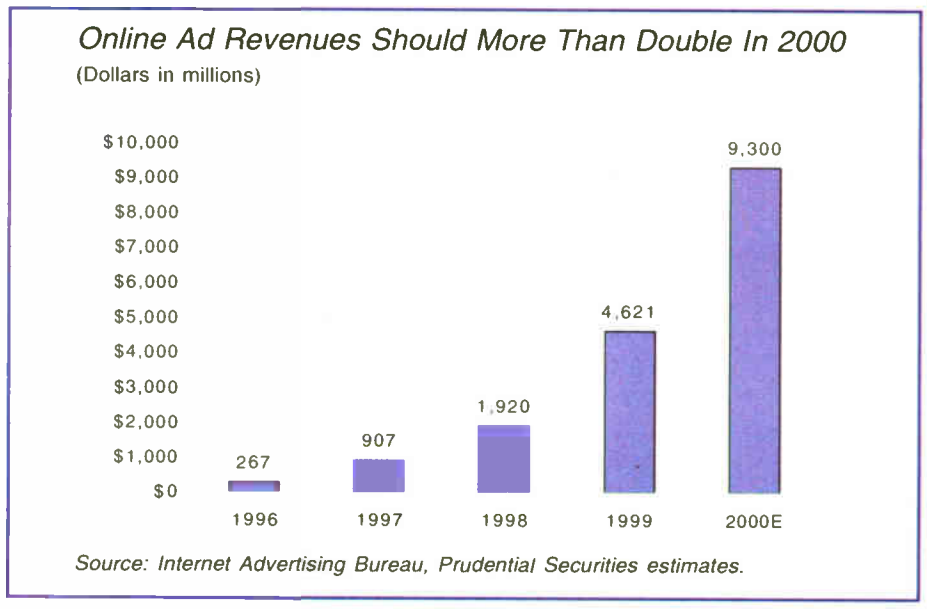
The trend is evident. As more consumers become attracted to Internet audio streaming, they redefine both media audience consumption and advertising habits. For radio executives, these Internet users are poised to be the core of future listeners.

We know that ad agencies are paying closer attention to the dynamics of Webcasting ("Ad Agencies Want Net Web Spots," **RW**, June 7). While streaming technology is still in an embryonic stage compared to traditional media, this is a good time to take a closer look at the relationship between Internet usage and today's radio audiences.

One recent study addresses that very issue. According to a detailed analysis by Broadcast Architecture, a Princeton, N.J., radio consulting firm, of radio listeners 15 to 54 years of age, nearly 80 percent now have access to the Internet and e-mail.

The study was conducted among 7,230 radio listeners of music formats from January through May who spent at least one hour per day listening to the radio.

See DITINGO, page 25 ▶



▶ DITINGO, continued from page 24

Nearly one fourth of those listeners surf the Web every day, the vast majority of whom spend two hours or less per day online.

Among those listeners with access, 44 percent have viewed a radio station Web site in the past year, 49 percent listen to the radio (from a separate appliance) while they are online, and nearly one third (29 percent) have listened to radio stations or audio streaming services on the Web. At the same time, an impressive 54 percent have made online purchases.

And while teen consumers register a higher level of Internet access than other age groups, they tend to listen less to Internet radio. The key demographic cells for radio listeners who are also Internet "streamies" are (in descending order): 35 to 44 (31 percent), 18 to 24 (29 percent), 25 to 34 and 45 to 54 (28 percent each) and 15 to 17 (19 percent).

Gender wise, males with Internet access listen to audio Webcasts on a more regular basis (41 percent daily) than do women. Twenty-five percent of the female Internet users listen to audio Webcasts.

According to the study, today's existing radio consumers, who are moving toward their peak income years — ages 35 to 44 — are the same as those attracted to radio on the Internet.

However, as the younger end of the demographic spectrum continues to access the Internet and grow up on interactive technology, they will undoubtedly form the foundation for radio's next generation of listeners.

Right time

The study's overall findings suggest that, for those general managers who haven't already done so, the time is ripe to incorporate an Internet business plan into next year's budget. But if you are one of the hundreds of radio executives who remain unconvinced that investing in audio streaming will help solidify a station's loyal listener base, here is some further proof.

Frank Cody, president and CEO of Broadcast Architecture, said participants in focus group studies usually cite their favorite radio station, if its programming is available on the Net, as their "preferred" audio streaming choice.

Meanwhile, the introduction of DSL and cable modem high-speed Internet access is improving vastly the quality of audio streaming, raising its value to both marketers and consumers.

This is true even though analysts have noted that high-speed Internet users amount to only 5 percent to 10 percent of all online users. However, this percentage range is expected to increase significantly during the next five years, presenting a "ground-floor" opportunity for those companies willing to invest in Webcasting.

At the same time, some major sports leagues, including Major League Baseball, have studied various Webcast strategies and place a premium on Internet streaming when it comes to broadcast rights packages.

Mounting evidence

For those remaining naysayers who believe radio listening and buying habits are not changing, here are two other indicators that underscore the fact that the Internet marketplace is a major component for radio advertising now.

Digital PC technology has rewritten the rules of the radio business.

Interep launched a new media division in June to focus on the sales and marketing opportunities of audio streaming from broadcast stations and other complementary forms of audio entertainment.

"As audio entertainment evolves, this is the natural offshoot to bring a new avenue of revenues to our client stations," said Graham Keenan, president of Interep's new division.

Fueled by increasing computer usage, consumers continue to expand the dot-com marketing business. More business ads are being placed at dot-com sites and dot-com companies continue to feverishly advertise on conventional media.

For example, according to the June media outlook report from Prudential Securities, advertising on Internet Web sites in 1999 reached $4.62 billion, up a whopping 141 percent from the $1.92 billion spent in 1998. (See accompanying chart).

Radio stations with integrated Web sites that serve as major portals for local and national businesses will be in excellent position to capitalize on these new dollars.

Electronic ratings

Digital technology is not only changing the face of traditional radio listening, it may soon reinvent how to measure radio audiences, if fourth-quarter tests of an electronic portable meter in Philadelphia prove successful.

Simply stated, such a system would revolutionize the time-frame accuracy of radio listening, which would be a boon for broadcasters, ad agencies and advertisers alike. It would also level the playing field in the ratings data collection for the audio and visual media.

If implemented nationwide, consumers will be asked to carry a non-intrusive pager-sized device, known as the portable people meter (PPM), that can track exposure to radio, television, cable and satellite TV ("Arbitron and Nielson Sign Agreement," RW, July 5).

The device would detect inaudible station identification codes that broadcasters embed into the audio portion of their programs using encoders developed by Arbitron.

The participants will then be asked to place the meter into a small, rechargeable base station at the end of each day. This "station" would send the collected codes directly to Arbitron for tabulation.

The new electronic device will be able to encode a station's Internet audio path in addition to its over-the-air transmitter path. In so doing, radio executives will be able to tell which audio path the listener hears.

Nielson Media Research will provide financial support and its television research expertise in the Arbitron test. That move is seen as the first step in the possible joint deployment of the new technology.

■■■

Vincent M. Ditingo writes frequently on radio management, marketing and information technology issues. Contact him via e-mail at vditingo@aol.com

PROMO POWER

How to Build Promotion Departments

Mark Lapidus

Consolidation has caused many stations to reconsider the division of labor in promotion departments. In some markets, this initially meant a dramatic reduction in the number of employees.

Smart operators quickly realized that this is one area where we really do require a reasonable quantity of "get it done" street fighters. But others continue to try to spread three people over as many as six stations. These poor promotion newbies learn little, burn out quickly and often fail entirely.

How do we build a quality promotion department today? To offer reasonable answers, I must generalize, but hopefully this will at least begin discussion about your structure before you head into the budgeting process for 2001.

Who does what

Let's examine numbers and responsibilities. I believe that actively formatted radio stations require one dedicated promotion director. This is an execution position. The promotion director should be responsible for event management, sales promotions, daily contesting, chairing of weekly promotion meetings, vehicle/street toy assignment, maintenance, meetings with clients and non-profits as needed and scheduling of promotional inventory.

When we lay out actual promotion director responsibilities, it becomes crystal clear that this person should not be stretched over

See PROMO POWER, page 28 ▶

Clutter

▶ Continued from page 24

"Clutter is not as critical with an all-news or sports station because people are always tuning in and out. But with a music station, it's very important."

The American Association of Advertising Agencies is interested in the effectiveness of all available media. Meribeth Papuga, AAAA's local broadcast chairwoman, said, "Stations have reached a point where advertisers are lost in the commercial clusters in which their spots are placed."

Papuga also said many advertisers prefer to be on stations on which breaks are less than six minutes.

"Our risk as advertisers is that listeners will push the button when the breaks come on."

Good copy and often

Stuart J. Sharpe is president of Regional Reps Corp., a firm that works with national and regional media buyers on behalf of Cleveland-area radio stations.

Sharpe believes that compelling copy coupled with the frequency of the message is more important than the clutter factor.

"There is probably some upper limit at which you will lose your audience, but 'clutter' is often just another term that agency buyers use like 'cost per point' to negotiate with radio stations."

Sharpe said that he continues to see tremendous growth in local and network revenue in spite of the higher trends in commercial content.

"Sales Insights (Biggest Local Spenders Speak Up)," a study produced by Arbitron, listed clutter as a factor in media buying decisions. While it ranked well behind such criteria as ability to target a consumer, cost efficiency and others, about half the respondents cited the high number of spots per hour as one of the items they consider when comparing radio to newspaper and television.

Marlene Kruelle

"It's obvious that foreground stations can have more minutes of commercial content because people are actively listening for information. If you've tuned in for words, you won't be surprised," said Mark Lipsky, president of Radio Direct Response, an advertising agency that works exclusively with radio.

"With a music-based format, even a three minute break may be too much."

Lipsky jokingly said that every radio sales manager would love to have 57 minutes of spots and one song each hour, while program directors would love the opposite.

Radio value

"While it's good that advertisers have found the value in radio, especially for dot-coms, the policy on spot load is set internally at each station," said Lipsky. "The general manager is usually the arbitrator between sales and programming."

Lipsky said listener patience with shows with long spot breaks, such as Howard Stern's, are a testament to the programming.

"We have a limit on spot loads and we stick to that limit," said Annie McGuire, director of sales for Greater Boston Radio Group, which owns four music-oriented and one talk station on the FM dial in the Boston area. McGuire believes commercials may be less obtrusive in a talk format.

But, she said, "There are some commercials we won't run under any conditions because we don't want to drive listeners away."

At KYW(AM), a news radio station in Philadelphia, there is an alternative to the "spot cluster."

"We run each commercial in its own island, surrounded by information such as news or sports," said Marc Rayfield, KYW(AM) general manager.

Annie McGuire

"We think clutter matters so we don't run clusters at all." The station, owned by Infinity Broadcasting, has not added to its spot load in 19 years, according to Rayfield.

"We've gone through a quarter where it was a seller's market," said AAAA's Papuga. "If the industry continues to add clutter we may begin to recommend against radio. People won't walk away entirely, but they may try to buy around it."

Pahutski is not sure what the future will bring for radio's profit picture.

"With the shakeout in tech and e-commerce companies, it'll be interesting to see how their budgets will be cut and if radio will be the first thing to go," said Empower's Pahutski. "But if radio is working for them, the clutter won't matter."

STATION SERVICES

Industry Vets Form New Service

Four friends, all radio industry veterans, have formed a new 24-hour programming service, "Forever Young."

"Forever Young" is a blend of non-rock hits from the 1960s and '70s and features a mix of about 70 percent vocal music and 30 percent instrumental, according to one of the service's founding principles, Charles Whitaker.

A sample list of artists to be heard on "Forever Young" radio includes Dionne Warwick, Frank Sinatra, Chrissie Hynde, Paul Simon, Tony Bennett, Sergio Mendes & Brasil 66 and The Beatles.

Three young guys circa 1967

"We see a big market for people who grew up with these artists. They loved the music that we will feature in the 'Forever Young' format then, and they love it still today," said Whitaker.

Three young guys 20-plus years later, (from left): Lynn Christian, Dick Gary and Charlie Whitaker

Whitaker is the creator of the "Sound of the Good Life" format that was the "first big FM ratings success in New York City," according to Forever Young press materials. He is joined in the "Forever Young" enterprise by Lynn Christian, a former senior vice president at both the NAB and RAB, and Dick Gary of the music industry advertising firm The Gary Group.

George Kravis, an FM broadcaster in Tulsa, Okla., will join the project.

For more information contact Charles Whitaker in Dallas at (214) 363-7588 or via e-mail to foreveradio@aol.com

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MediaTouch

Promo Power

▶ Continued from page 25

more than one property.

The only understandable exception is budget constraints due to poor ratings or sales performance. However, once you have a promotion director in charge of several properties, there is no way he or she can effectively take care of all the responsibilities outlined above.

Don't go it alone

Can a promotion director do it all alone? Absolutely not! For extremely active stations, two assistant promotion directors are preferable. However, I've seen stations stay healthy with only one assistant and several reliable paid part-timers (not just come-and-go interns).

Great promotion directors delegate the following to assistant promotion directors: 1.) Smaller jock appearances/events; 2.) Vehicle maintenance; 3.) Contest fulfillment and 4.) keeping the promotion calendar up-to-date.

Poor promotion newbies learn little, burn out quickly and often fail entirely.

Assignment of these tasks frees up large time blocks, so a promotion director can focus on the many other important aspects of her job.

If the promotion director is doing all this stuff, why do we need a marketing director? The reason is implicit in the title. These are the folks who are in charge of marketing the radio station.

Yes, most have been promotion directors. Yes, they must oversee everything a promotion director does. But, no, they should not be involved too much daily execution.

This would be like your program director doing several airshifts daily and really trying to program your radio station. (I'm aware that some PDs are doing automated airshifts across several markets, but they've probably got regional VPs making the real programming decisions.)

If your marketing director is doing what I've outlined above for a promotion director, then she's simply got the wrong title. She's a promotion director.

Strategic planning

A marketing director sets the annual strategic plan for all outside/internal marketing for the radio station, makes decisions with her partner — the program director — about what to promote on-air, writes or at least takes part in the writing/production process of station promos, oversees creative for advertising campaigns, proactively develops partners who bring benefits to listeners, regularly works the press to generate coverage, devises methods of bringing in cume and TSL such as contesting and develops a training program for a promotion director to learn about marketing and a program where assistants can move up to become promotion directors.

The promotion director should not be stretched over more than one property.

Can a marketing director handle more than one station? Absolutely! I must qualify my answer, though, by saying that the number of stations depends how deeply they are involved in daily execution and the level of their experience.

I know of marketing directors who can handle a cluster of stations — but they also have learned how to hire terrific people and delegate appropriately.

There are numerous advantages to having such a person on staff, not the least of which is this: Since they oversee the marketing/promotion activity at several stations, they will have the ability to target the right opportunities to the station which can benefit the most in the group.

This can help sales as well. Often a marketing director with responsibility over several radio stations will see how a cluster can secure an entire event-based buy using the power of multiple frequencies.

In the big scheme of things, people are our most important asset. Let's not allow continued consolidation destroy what should be the heart and soul of a radio station — the marketing and promotion department.

■■■

Mark Lapidus is president of Lapidus Media. Reach him via e-mail him at marklapidus@yahoo.com

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Monetize *THIS!* — What a difference a few billion in IPO and VC money makes.

Last year, the **Streaming Media East show in New York City** was rather dour. Geeky guys crowded around the cramped quarters at the Sheraton. "Stickiness" was the buzzword that defined the show — no, not how to deal with the summer heat in NYC, but how to get visitors to stick around Web sites. The high point of the droll affair was watching a pair of pimply plutocrats explode with joy over the IPO that had just made them millionaires.

This year's show at the Hilton in June was a move upscale, as the change in venue suggests. The single floor of vendor exhibits had grown into three full levels.

What's more, the typical booth was adorned with an incredibly **opulent array of technology**. Forget cathode ray tube (CRT) displays to demonstrate software. Even desktop thin film transistor (TFT) monitors were passé.

The upstart corporate status symbol of choice was the 40-inch flat panel plasma display. Some had three or more on hand to make sure everyone had a good look at what they were pitching. Because these cost about **$10,000 each,** companies with a fleet of them obviously had **a load of loot** for marketing.

(I'll be watching Ebay for when these goodies go up for grabs after the present owners go bust by burning through all their funding on such frills.)

The buzzword at the show was "monetize." Schemes to "monetize" audio and video were abundant. A sense of urgency about achieving some level of "monetization" for vendors and potential clients permeated the proceedings.

This reflected the fact that most all companies present remain in a "pre-monetized" (i.e., unprofitable) state.

Meanwhile, **Napsterites** nationwide continued to rebel against the move to "monetize." Some soberly suggested that most "monetization" efforts run contrary to already ingrained consumer habits online.

Keynote speaker Michael Robertson, MP3.com's CEO and chairman, made an excellent case for **abandoning what has become the Holy Grail** for many — the ability to put **"digital barbed wire"** around intellectual property.

According to Robertson, open access will lead to increased revenues. Curiously, Robertson came to the show **riding on his company's settlements with Warner Music and BMG.**

Terms of the settlement were not disclosed, but rumors put the figure at up to **$100 million.** Robertson's message ran counter to the deal he's had to make with a record industry that remains skeptical about this "open access" concept.

Among the exhibitors, **Microsoft's Windows Media** and **Real Networks** continued to bat it out for dominance in the streaming media player field.

Each had their latest releases on display (mostly on backlit projectors — no flat panels were evident). Despite the vast resources these companies enjoy, a third player may change the landscape.

A startup named **Wildform** had no booth at the show — no screen, monitor or display apparatus whatsoever. No Wildform spokesperson had a place on any podium. However, **the company's soon-to-be released streaming technology** based on the open code **"Flash" player** could upend the industry.

Michael Robertson

Wildform **CEO Jonathan Blank** as well as **President and COO Colby Devitt** wandered around anonymously with the 11,000 other attendees. Expect that to change quickly. Already, **the New York Times is using Wildform technology** to connect online visitors to audio clips seamlessly.

Elsewhere at the show, **GlobalMedia President and CEO Jeff Mandelbaum** was in attendance following his company's acquisition of **OnRadio.com's**

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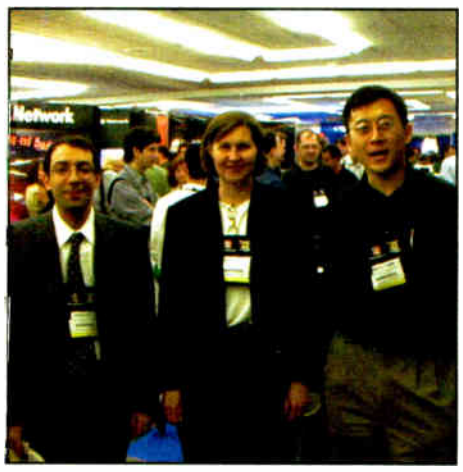
▶ WEBWATCH, continued from page 30
contractual agreements with 212 radio stations. The deal to provide Internet services for the terrestrial radio stations cost **$500,000** plus up to 1.7 million shares of GlobalMedia's stock.

The Wildform staff, from left: Arjun Nayyar, Jonathon Blank, Colby Devitt and Ari Blank

Among the exhibitors, the showcase for GlobalMedia's services was **Fashion.TV,** the **Paris-based** program producer. **Streamed images of models cruising the catwalk** appeared on a huge plasma screen. According to Mandelbaum, this opulent display was not the result of ill-spent investment dollars but came from extending the Fashion.TV brand profitably online with GlobalMedia.

"We write them some nice checks," said Mandelbaum.



Dalet's Stephane Guez, Anna Mae Sokusky and Robin Wang

Meanwhile, **Dalet** demonstrated the applicability of its broadcast products in the expanding multimedia landscape. **Anna Mae Sokusky, president of Dalet USA** and **CEO Stephane Guez** presided over laptop presentations. **Orban**, too, was in attendance with a pre-processing unit designed to improve Internet audio quality.

Finally, **Lightningcast's Tom Des Jardins** portrayed the possibilities for his company's advertising insertion technology better than any produced pitch.

In and around the show, the **International Webcasters Association** met with the Madison Avenue advertising community to see about making advertising-based online business models a reality. At the same time, a new trade organization, the **Streaming Media Alliance**, had its first meetings.

Beyond the event

Partnerships and strategic alliances continue throughout the online world.

StreamSearch and **House of Blues Digital, Inc.** announced that the former will provide online access to all of **HOB's** content.

One-On-One Sports announced in June that broadcastspots.com will provide online access to its commercial spot inventory.

One-On-One **Chairman, President and CEO Chris Brennan** said the alliance will allow agencies and media buyers easier access to inventory. "It's a great way to expand our sales force."

Much as the Web can be a medium for marketing traditional media, established ad sales companies are getting into online advertising sales. **MediaAmerica** announced that it has signed both **StreamAudio.com** and **DiscJockey.com** to represent these companies' interactive advertising.

Grasshopper's way

For those struggling along without benefit of venture capital funding or IPO dough, advertising isn't the only way to generate revenues to buy huge plasma displays for trade shows.

SpikeRadio has shown that sponsorship has its advantages. **Toyota has extended its million-dollar sponsorship** of the L.A.-based Webcaster for the next year. The sponsorship targets the **"global youth market."** SpikeRadio has created a series of 30-second spots and "advertorial features" that will stream through the SpikeRadio player.

"The deal confirms Toyota's commitment to youth, and confidence in SpikeRadio's ability to brand online and create a sustainable dialogue with the Web's most difficult to reach demographic," said **Ashley Farr, president of SpikeRadio.**

As if popping the NASDAQ's bubble in April with its report about the imminent failure of online retailers wasn't enough (*Web Watch*, **RW**, June 7), **Forrester Research** published a study that should shake jittery radio stock investors.

Tom Des Jardins at the SME Lightningcast booth

"The Self-serve Audio Evolution" details three waves of multimedia appliances that will lure listeners off the airwaves.

"The bottom line is that consumer demand for anytime, anywhere access to **personalized audio will slowly but surely displace broadcast radio,"** said Forrester Senior Analyst Jeremy Schwartz.

How slowly? In as fast as five years, according to the Forrester report. The report predicts that **41 percent of U.S. consumers will opt for "self-serve"** by 2005, meaning that rather than rely on programmers to pick and choose what they hear, they will prefer to do their own programming.

Jeremy Schwartz

Mind you, that's not just any chunk of the radio audience — it's the richest, most sophisticated segment. **Maybe LPFM, not IBOC, is the future of radio ...**

Of course, the new media's impact goes well beyond radio. **The United States Postal Service** is girding itself for a future where **"snail mail"** is completely replaced by electronic bill paying and e-mail.

Streaming Media East was a mob scene

While it may only be staving off the inevitable, **BroadcastAmerica.com** may keep the **USPS** afloat for a while — if only through the continuous stream of press releases announcing almost hourly additions to their roster of content and whatever else you care to mention (or, actually, that they hope I mention).

According to the notices now stuffing my recycling bin, the company **has surpassed Yahoo! (nee Broadcast.com) as the "world's largest Internet broadcaster."**

Other online writers (not to be mentioned here by name) have honored company **President and COO John Brier** as one of the "most influential" people in streaming media.

How have these shrewd Yankees taken the streaming media business by storm?

Seeing as they are located just down the road from me in Portland, Maine, I should be paying them a visit soon. What will I find? A plethora of enormous flat panel plasma displays exerting influence by projecting Brier's image throughout the office? If that's the secret, I won't tell...

■■■

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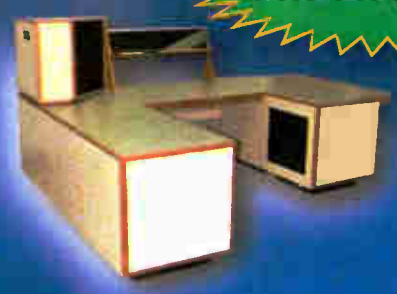

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Symetrix 506E List $529.00

'Radio Wayne' Memorialized

Wayne Cornils, the Radio Advertising Bureau's executive vice president of meetings, died July 5 following a 12-year fight with cancer. He would have been 65 this month.

"Wayne Cornils set the standard for professionalism in radio and we join with his family and the rest of the industry in mourning his passing," said NAB President Eddie O. Fritts.

Cornils served on the NAB board of directors as vice president of radio membership (1976 to 1978) and as senior vice president of the NAB Radio Department through 1983. He moved to RAB in 1983, then left to join Transtar Radio Networks six years later. He returned to RAB in 1991.

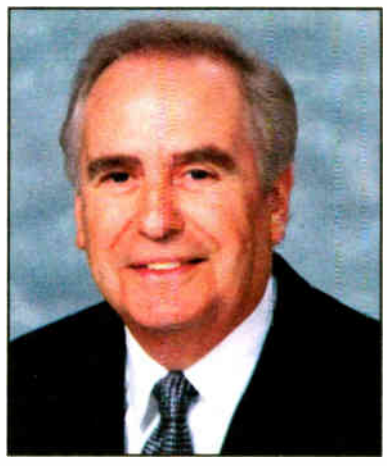
He was known to many friends and colleagues as "Radio Wayne."

According to the RAB, Cornils is survived by his wife Wendy Green, three adult children and several grandchildren.

"Wayne had a tremendous impact on this industry," said Gary Fries, RAB president and CEO.

An industry-wide memorial service is scheduled tentatively for Wednesday, Sept. 20, in San Francisco. The NAB Radio Show begins that day.

Memorial contributions can be made in Cornils' honor to the Broadcast Foundation Endowment Fund or The Roaring Fork Conservancy in Basalt, Colo.



Wayne Cornils

How to Make Money on The Internet

Paul Kaminski

The old business axiom "don't leave money on the table" is perhaps even more a guideline for radio stations that wish to make money from their station Web sites.

How fast-growing is the Internet? Radio Advertising Bureau Vice Presidents Dave Casper and Mike Mahone cite critical mass figures to answer this question.

According to Casper and Mahone, the point of critical mass is the point at which a medium achieves a 50-million unit penetration.

Radio took 38 years to reach the figure; television 13. The Internet took 5 years to reach the 50-million mark, according to Casper and Mahone.

New world order

The Internet fundamentally changes the business dynamic, because of its versatility. Casper and Mahone said the Internet should not be viewed as a simple communications system, but rather a system that is an ad medium, a research tool and a complete end-to-end marketing system.

The facet of the Net that is the greatest agent for change is the ability for the user to initiate back-channel communications.

"The immediate response and the opportunity for user feedback put the user in total control. This is why the Internet changes everything" said Casper.

The topic of dot-com advertising and how stations can exploit it on their level piqued much interest at a session at the NAB2000 show last spring.

Paine Webber estimates radio should capture 50 percent of the dot-com business in 2000. Casper and Mahone said that so far, buys don't seem to reach past larger markets, but they gave an alternative strategy for stations seeking a piece of the dot-com pie.

They suggested stations look for the IPO (Initial Public Offerings) players in their area. They recommend a Web site for those interested in the names and strategies of the IPO players: *www.ipo.com*

They took the strategy a bit further, suggesting stations look aggressively for local and regional dot-com advertisers in their service areas, and develop a dot-com media kit, with a dot-com media specialist from the staff.

Stations wishing to market to these businesses should ensure their media kits reflect a sophistication about the market and how wired the market is.

Casper and Mahone warn against the tendency to bundle the Web site with traditional packages. The duo exhorts radio station sales staff and managers to set a price for every Web opportunity.

They also suggested that stations seriously consider the use of classified ads on their site, calling it a potent weapon against the newspaper's traditional advantage in that form of advertising.

Casper and Mahone said the Internet posed a major competitive threat to radio, but also posed an opportunity for those stations that take the time to build a great station Web site, and also position their station as the best way to drive Net traffic.

Studio Sessions

RW Tests Hafler's M5 Speakers
Page 37

PRODUCER PROFILE

At WNIC, Nice Guys Finish First

Ken R.

In the Motor City, one might expect an urban station to be the ratings leader. However, the 12-plus king in the latest Arbitron ratings is an adult contemporary station. Even more amazing in these days of potty-mouth morning shows is that WNIC(FM) in Detroit does this by playing it clean all the way.

"If the morning show would even say 'whiz' (referring to urinating), we might get a complaint," said Mike Bradley, production director and morning show producer. "So we're very careful that everything we do appeals to the whole family."

No potty mouth

Bradley, along with his star morning man and Program Director Jim Harper and Assistant Production Director Elaine Ellis, are vigilant against offensive language and topics, even in commercials.

When the Nielsen rating sweep periods crop up, WNIC is often presented with rude and crude commercials from the TV stations promoting Jerry Springer or one of several other controversial shows.

"There are times when we have to edit content," said Bradley, "but we always do it with the approval of the client. We might call them up and say, 'You have a promo here talking about multiple moms. Do you mind if we take that out or run another spot?'"

"Both Elaine and I have the authority to say whether or not a spot works on our station, so there are times we need to discuss copy with the sales reps," said Bradley. "We get excellent cooperation because they know what's going to work for us."

Elaine Ellis, who handles most of the production chores, has been with WNIC seven years.

"She started as an intern and has been doing production four years," said Bradley. "She's become the station expert on the Orban Audicy workstation. When people have a question, they come to her."

Bradley has presided at WNIC since 1989, but he was also at the station from 1978 through 1985.

"In between those times Jim Harper started another station here in Detroit, WDTX(FM), which lasted two years," said Bradley. "That place had too many chiefs and not enough Indians. It kind of blew up."

In 1987 Bradley worked 18 months at another Detroit station, WLLZ(FM). Then when Harper returned to WNIC, he called for Bradley.

Other people at WNIC have long tenure as well. News Director Dave Lockhart has been there for 15 years, midday talent Gene Maxwell for 20 and Harper for 12.

"I think it's that combination of longevity and dedication that makes this thing work," said Bradley.

"The focus is always on the listener," added Ellis. "If someone calls with a question, we usually end up with three or four people working on the answer."

See WNIC, page 39 ▶

Mike Bradley

PRODUCT EVALUATION

Denon Recorder: No Moving Parts

Alan R. Peterson

The new DN-F20R portable IC recorder from Denon takes the classic over-the-shoulder news-gathering deck and eliminates the last weak link left over from cassette days: moving parts.

The DN-F20R accepts line-level and mic-level audio, mono or stereo, and records it as data to Compact Flash RAM cards. The deck can accommodate cards up to 192 MB in capacity and offers a choice of linear PCM or MPEG 1 and 2 compressed recording modes.

Controls consist of straightforward Play, Stop, Record, Fast Forward and Rewind buttons, with the more complicated features tucked inside menus behind a single Mode button. Anyone used to hitting the bricks with a portable cassette or MD unit will be instantly familiar with the DN-F20R.

The problems with gathering audio for radio news are associated with cassette tape. Reporters swear by those precious decks they have used since the '80s, but tapes are prone to clogs, jams and slipping off tape guides.

Jim McGuinness of Denon shows off the DN-F20R

Tapes also are noisy when they age and flake when sitting in hot cars all summer. Deadlines can be missed when reliability is impaired.

While MiniDisc devices have fewer moving parts, a recording can still suffer from inopportune and poorly placed impact to the unit, say in a crowd. A dinged case could seize up the drive motor or actuator arm.

The DN-F20R gets around that by removing any parts that move — except the reporter. Audio is digitized and recorded onto a solid-state RAM module no bigger than a matchbook.

Every time the Record button is engaged, a newly recorded segment is automatically given a file name making individual cuts easy-to-find back in the newsroom.

See DENON, page 36 ▶

Denon

▶ Continued from page 35

And the deck can take it in the nose, too. Whether a badly placed elbow hit in a melee or capturing a shouting match at City Hall (it has a built-in limiter), this recorder turns in a good performance.

The DN-F20R also has XLR mic connectors. Many MD and cassette decks have only an eighth-inch mini-jack for a mic input, forcing the use of a kludged XLR-to-mini adapter. Who knows how many tidbits of history have been lost over the years because of iffy microphone connections.

Some argue that a balanced XLR cable less than five feet long is unnecessary, and that a mini-plug is less-prone to damaging the deck; if the cable gets stepped on, a mini jack pops out without taking the deck out of service.

But if my career hinges on getting the sound bite nobody else does, I want a cable connection that is going to hang on for dear life. Besides, if one's biggest fear is having a cable that someone will step on, *use a shorter cable!*

The battery door has a secure locking slider to keep the door secure, which is another plus. Sure, it doesn't "conveniently snap shut" like other products, but then again it doesn't snap *open* as easily and spill batteries all over the floor when the president is talking to you.

The power switch is recessed and protected by side rims, so it won't accidentally get switched off. However, the deck will be turned off by the Auto Power Off function if not used for a period determined in the user menu. This mode is defeated when running the DN-F20R from wall voltage or it can be defeated from the user menu.

Approximate recording times vary widely, depending on RAM card capacity and recording mode the DN-F20R is set for. For example, with 32 MB media, the range is 2.8 minutes for an uncompressed stereo recording and goes up to 68 minutes for an MPEG2 Layer 2 mono recording at 64 kbps.

If a 192 MB card were used, the recording time increases to 17 minutes for uncompressed stereo and almost seven hours of MPEG2 Layer 2 mono recording at 64 kbps.

It is tempting to pull the bit rate down to increase the recording time available on a RAM card, but don't take it to extremes.

I set it as far down as it would go — 24 kHz at 16 kbps setting, for 10 kHz response — and a test recording came back muddy and full of warble. Every news director I know would consider this un-airable.

The best overall setting seemed to be 48 kHz at a 64 kbps recording bit rate. Some highs were compromised, but the result represented a nice middle ground between card capacity and audio quality appropriate for both AM and FM broadcast.

The DN-F20R saves audio as files in directories. Each cut is automatically named and assigned a directory — "4001.mpg" means MPEG file No. 1 in Directory No. 4, while "8541.wav" implies the 541st WAV file saved in Directory 8.

A Mode button atop the case is used to activate the recording mode menu, where the reporter can pick from the available formats and sample rates. Press the round Enter button and it's time to hit the streets.

It is not even necessary to look at the buttons to know you are recording. The rectangular Record button has a raised dot in the center, while the Play/Pause key has a concave depression in it. Both give a nice tactile click when activated. A recording can be done strictly by feel.

A concentrically stacked pot, recessed into the right side of the deck, handles record levels. Similarly, a quarter-inch stereo phone jack is found on the left side, next to a headphone level control.

Just when you got used to those inadequate eighth-inch headset jacks on other decks, along comes Denon to pull you back into the professional world.

Also on the left panel are the power switch, the battery eliminator jack and a port for a remote control device that strangely is not even offered by Denon.

The manual contains a schematic (for "reference purposes" only) for a button box that uses a resistor tree to implement many of the functions found on the panel. If you want it, you have to build it yourself. For ENG use, don't even bother.

The sling-and-go Denon DN-F20R IC Recorder: As simple a field recorder as a reporter wants

Product Capsule:
Denon DN-F20R
Portable IC Recorder

Thumbs Up
- ✓ Operates exactly the way a news reporter wants it to
- ✓ XLR mic inputs
- ✓ No moving parts
- ✓ Extensive menu options

Thumbs Down
- ✓ No playlist editing
- ✓ Cumbersome file name entry

For information contact Denon in New Jersey at (973) 396-0810 or in California at (562) 565-1730 or check out the Web site at www.del.denon.com

The Denon DN-F20R removes any parts that move — except the reporter.

Back on the right side are the stereo XLR mic jacks and a set of RCA line In/Out jacks. An unbalanced output makes sense, as many newsrooms are configured to take an unbalanced line signal off of reporters' portable decks. To expect XLR outputs on this unit would be practical, but would go against the modus operandi of nearly every radio newsroom.

Editing and erasing

Once recorded, it is possible to name a cut for future indexing. Use the Mode button to enter File Name Edit mode, then use the Rewind and Fast Forward buttons to select characters. This is not as fast as using an edit wheel controller to spin through the alphabet, but there is little room on this unit to afford the placement of a rotary encoder.

Files must comply with DOS 8.3 name formats; eight letters, a period and a three-letter extension in capital letters. Should the reporter wish to move cuts into a PC, note there is no Windows long-name support.

Also, the tiny size RAM cards require an ATA adapter card, which costs around $12, for use with a standard PCMCIA slot.

For desktop computers, some companies offer docking ports for around $50 in USB or parallel connections that become another drive on the system.

Dividing files into useable segments are also done with the Mode button. A four-second section of audio is isolated, and the Rewind and Fast Forward keys are used to advance or back up the audio in steps of 0.048 seconds when set at 24 kHz sample frequency. Hit Enter and the divide position is established.

One thing I could not get the DN-F20R to do was create a typical news "wrap" in the field. It is possible on several MiniDisc machines to generate a small playlist that will play the reporter's intro, jump ahead to the edited quote by the politician, then jump back for the reporter's outro.

I suppose I could come up with a way to place announcer wraps in one directory and isolate the newsworthy audio in another, but that gets cumbersome. Denon should include this feature for the next generation of IC recorders. This would place it on par with many MD machines, field-ready hard-disk machines and other solid-state recorders.

But for what this deck does, it does well. Denon has placed a durable and dependable IC recorder over the shoulders of radio reporters with the features and simplicity needed in the heat of battle.

A good reporter will hit the ground with more than one memory card, an extra fistful of batteries, a dynamic mic and a stout XLR cable. The rewards of this diligence will be clean digital audio from the field without the noise and junk we have endured with our cassette decks.

So go ahead, sling a Denon DN-F20R over your arm, head for that press conference and bring 'em back alive.

■ ■ ■

*Alan Peterson is a technical adviser to **RW**, manager of technical systems at Fairfax Public Access Corp. in Fairfax, Va., and a 22-year broadcast pro.*

He can be reached via e-mail at peterson@fcac.org

PRODUCT GUIDE

HHB 80-Minute CD-R Bulk Pack

HHB launched its CDR80 Silver Bulk discs at this spring's NAB2000 convention. The 50-disc Cakepacks are unbranded; five packs come in a master carton.

The discs incorporate the second generation of Phthalocyanine dye. The CDR80 discs have an enhanced performance over the HHB CDR74 discs for the same price.

The CDs comply with Orange Book specs and will work with writers up to 12x speed.

HHB also redesigned its Web site offering easier access to its product line. A dealer and distributor locator provides a listing of international service centers, Genex product software updates, a press release archive and product photo library.

For more information contact HHB in California at (310) 319-1111 or visit the new Web site at www.hhbusa.com

PRODUCT EVALUATION

The Hafler M5 Passive Speakers

W.C. Alexander

Hafler introduced the M5 two-way passive near-field monitor at the spring National Sound Contractor's Association (NSCA) convention in Las Vegas.

The speakers have been designed for use in recording studios, post-production and broadcast applications.

Hafler sent **RW** a pair of M5 monitors to try out. I was interested in finding out how well a company that is known for amps and active monitors could make plain old speakers.

The M5 is a relatively small monitor, measuring just 6-3/4 inches by 12-3/16 inches by 7 inches, with only 5.3 liters internal volume.

Solid cabinet

The first thing I noticed taking them out of the box was that these speakers weighed a lot. At 10 pounds net weight, the 5/8-inch-thick cabinet is solid.

The M5s are magnetically shielded, which is becoming more important in today's computerized production and recording studios. In many applications, monitors are installed in close proximity to one or more computer monitors.

To minimize reflections, no grille is provided, nor is there any provision for attaching one.

Not surprisingly, the center of gravity seems to be forward and low — something that should be taken into consideration when mounting them.

Most of the back of the cabinet is covered with a recessed plastic piece in which the connector binding posts are set. This probably eliminates using the back of the speakers as a mounting point. There is no room to affix an Omnimount or other mounting bracket.

Reference monitors

In our broadcast production studios, we use several types of comparable reference monitors. That gave a good place to start with this evaluation.

I found the M5s to be at least as good as, if not better than, our other speaker systems. The M5 provided an excellent, uncolored sound that was as good as any reference monitor I have used.

It worked best when pointed directly toward the listener and with the tweeters in vertical alignment with one another. This arrangement provides the listener with the most mobility within the near-field environment while still maintaining good response and stereo imaging.

The M5 features a front-firing slotted port that, according to Hafler, port-tunes the system to 70 Hz. I

See HAFLER, page 41▶

So, What is the Linkwitz-Riley Filter?

Many types of filters exist and perform in different ways. Familiar types include Chebechev and Butterworth, but perhaps a name less familiar is the Linkwitz-Riley filter.

Butterworth filters, which are familiar to most engineers, have a cutoff frequency at the -3 dB point or about 70.7 percent of the passband amplitude. Meanwhile, the cutoff of the Linkwitz-Riley filter occurs at the -6 dB point or about 50 percent of the passband amplitude.

Strapping two 12 dB per octave Butterworth filters in series offers response similar to a Linkwitz-Riley filter — 70.7 percent of 70.7 percent is roughly 50 percent.

The Linkwitz-Riley filter is less susceptible to phase and level shifts. Also, in bi-amplification uses, high-pass and low-pass Linkwitz-Riley filters result in a flat combined output at the crossover point, where a Butterworth filter sums 3 dB higher. And the 4th order filter discussed in the accompanying article assures that the highs are in phase with the lows at the cutoff frequency.

A helpful source of information on the 24 dB per octave Linkwitz-Riley filters can be found at the Web site *http://kahuna.sdsu.edu/~tucker/diyaudio/xover.html* where author Matt Tucker also shows plans for an acetylene-propane potato launcher.

— Alan R. Peterson

Mechanical Drive Maintenance

Tom Vernon

Even in the dot-com world of modern radio, there are still a few mechanical maintenance chores to be done.

Whether it is the aircheck cassette recorder or the last reel-to-reel machine or turntable in the production room — if it goes around to make a sound, eventually it will need repairs.

Three types of systems

Hence, this article looks at maintaining the three types of mechanical drive systems — direct drive, motor/flywheel and motor/idler wheel.

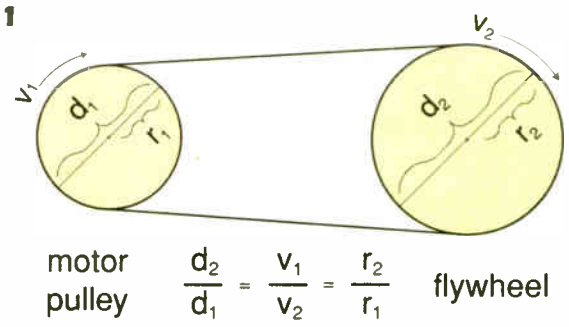
The simplest system is direct drive, which has been used in turntables, cart machines and reel machines. Typically, a high-torque synchronous motor is employed, with the shaft acting as the capstan.

Advantages are ease of maintenance, reliability and superior wow-and-flutter performance. The only disadvantage is the cost of sync motors.

Regular maintenance is confined to cleaning of the capstan and idler wheel surfaces to remove oxide buildup and occasionally checking the tension between them. Regular wow-and-flutter checks will tell when the motor bearings are nearly shot. If you miss these, the audible squealing noises that come later will be hard to ignore.

Usually, credit is given for returning worn motors against the purchase price of a new one. There are also still a few companies that specialize in rebuilding cart and tape motors, although they may be getting harder to find.

Fig. 1



Basic physics representation of pulley diameter to speed relationship, where v=rotational speed in rpm, d=diameter and r=radius

Many older cart machines use the motor/flywheel scheme. A sync motor with a small pulley on the shaft drives a large flywheel via two or three belts.

These transports have the advantage of lower initial cost, but the transports have inferior wow-and-flutter specs and need more maintenance.

Instant start is not possible due to the mass of the flywheel. Heavily used cart machines often have the motor running continuously so it wouldn't "wow" if the tapes are inserted and started quickly.

Maintenance consists of replacing stretched belts and worn flywheel assemblies, lubricating the thrust bearing and swing arm mechanism.

Occasionally, a motor will not run even though it is getting juice. This can be caused by either a defective motor or bad motor start capacitor.

To determine which is at fault, measure the resistance between the three windings of the motor. There should be about 130 ohms on each winding. If the motor checks out, then the capacitor is probably bad.

Going back to high school physics class, the rotational speed of the flywheel can be calculated by knowing the motor speed and the size ratio between the pulleys. Thus, a 2,500 RPM motor with an 8:1 ratio yields a theoretical flywheel velocity of 312.5 RPM. This is illustrated in Figure 1.

Thicker belt, slower speed

In reality, the thickness of the belt influences speed, increasing pulley diameter by as much as one-third the thickness of the belt. If the original belt is replaced with a thicker substitute, the result is a slower speed. This "reality" diagram of pulley/speed ratios is shown in Figure 2.

Precision-ground flat belts have more consistent speed characteristics than molded "O" rings. This is due to the changes in the thickness of the belt that can cause speed changes. As belts age, they stretch, resulting in increased length and slower speed. Slipping also becomes a problem.

Replacement belts should have the same inside diameter as the original when it was new, not as it is measured when taken out of service.

When servicing equipment that has several belts, replace all belts at once. Usually the time, trouble and labor costs of pulling a machine out of service far outweigh the cost of a few belts.

It is also important to clean all pulley grooves and contact surfaces before installation of new belts. If the machine has a motor speed control, play a calibrated test tape and verify proper speed when replacing belts.

Machines should be lubricated according to manufacturer instructions.

See MECHANICAL, page 39 ▶

WNIC

▶ Continued from page 35

While Mike Bradley comes in early and leaves shortly after "The Breakfast Club," Elaine Ellis comes in at 10 a.m. and puts in a full day creating commercials.

"We produce anywhere from 15 to 40 spots a week," said Ellis. "And that includes writing most of them."

At WNIC, all the announcers are available for voice work, but none of them run their own production equipment. Ellis records them directly into the Audicy, selects the appropriate music and effects and works closely with the clients.

The production room board is a vintage Wheatstone SP-42 with EV RE20 mics. The station airs the spots through an ENCO DAD$_{PRO}$32 system.

There is an old reel-to-reel deck, but it is primarily used for recording the morning show off the air to rerun "best-of" clips on Saturday mornings.

Ellis enjoys the unusual spots that come through the door.

So bad it's good

"We just got one for B.A.D. Sauce, which stands for Barbecue and Dippin'. The jingle is so bad it's good, and its slogan is 'just look for the pig that's mooning you,'" said Ellis.

The production room at WNIC used to be two smaller rooms, which are now combined. There are up to five mics available and spots can be sent to other stations via DCI digital delivery.

"The Audicy is our main tool," said Bradley. "My only complaint about it is that you only get 25 minutes per production. If you have lots of testimonials you have to edit down, then add music, you have to divide it up into several productions."

Elaine Ellis

"We use several music libraries," said Ellis. "We like our FirstCom 40 CD set and we also have more than 20 CDs from Network and Production Garden."

Ellis keeps track of which music selections are used for each client. The FirstCom library allows Ellis to select only the CDs she needs.

"I like that and I pick swing and lighter pop underscores that fit our format," said Ellis.

Both Bradley and Ellis use their own voices on spots when appropriate.

"I'm the sweet girl-next-door type," said Ellis, giggling.

"We don't like to run those hyped-up car dealer spots," said Bradley. "Our sales people know what will fly within our format."

"I have a good rapport with the sales reps," said Ellis. "My wish is that the client gets great results in a way the listener will like too."

Ellis has the philosophy that more flies can be caught with honey than with vinegar.

"I like to work hard, but that doesn't mean we jump in people's faces. We just try to exceed what people need," said Ellis. "The station is committed to a good product."

"Jim Harper will hear a spot occasionally and ask 'how did that slip in?'" said Bradley. "If he doesn't like something, I'll usually tell him it's Elaine's fault."

He's kidding, folks.

Station with a heart

WNIC is owned by AMFM Inc. When thinking of large broadcast groups, kindness usually is not the first corporate trait that comes to mind, but in this case it fits.

"Two years ago Elaine was diagnosed with multiple sclerosis," said Bradley. "It just made us appreciate her that much more. The GM got her a special chair to make it easier for her to work."

"I still get tired sometimes, but the station couldn't have been any nicer," said Ellis. They asked me if I wanted to keep working full time, go to part time or move into another position at the station."

"Production is in my blood," said Ellis. "So I can't complain."

■■■

Ken R. is a former broadcaster who now devotes full time to writing.

Tell us about your production wizards at radioworld@imaspub.com

▶ MECHANICAL, continued from page 38

Many newer motors have permanently lubricated bearings that can be damaged if they are oiled.

Some less-expensive sync motors typically require periodic disassembly — usually every six months — and soaking of felt washers with Wynn's Friction Proofing Oil. Flywheel thrust bearings should get a dab of Lubriplate and be adjusted for 1/16-inch end play.

Another popular drive method employs an idler wheel between the motor shaft and rotating surface, as with older turntables. Most of these turntables drove the outside rim of the platter with the idler wheel, although one manufacturer drove the inside rim for better rumble characteristics.

In either case, maintenance involves weekly cleaning of all drive surfaces. Rim drive turntables have adjustment screws that provide a trade-off between instant start and reasonable rumble characteristics.

Sometimes the speed-shift lever of the turntable is left engaged and the idler wheel is pressed against the motor shaft. This will deform the rubber surface of the idler wheel and produce an audible thumping.

Running the turntable for a while may get rid of the indentation, depending on the severity and type of idler wheel.

Higher-quality idler wheels are made of silicon rubber or other good material that retains its shape.

Lower-cost wheels are made of neoprene and do not keep their original shape for as long. It may be necessary to sand neoprene wheels to get rid of indentations.

Some types of head cleaners may damage rubber parts. The best overall cleaner for heads and rubber is mineral spirits. It takes longer to dry than alcohol or aerosol products, but will not harm anything.

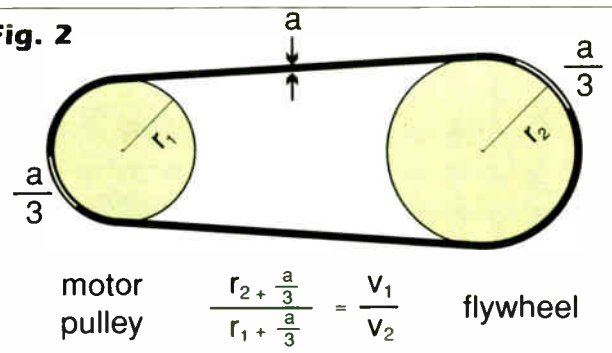
Don't despair if replacement idlers or other rubber parts for obsolete machines are needed. A few companies, such as PRB, will remanufacture parts if you can provide an original.

■■■

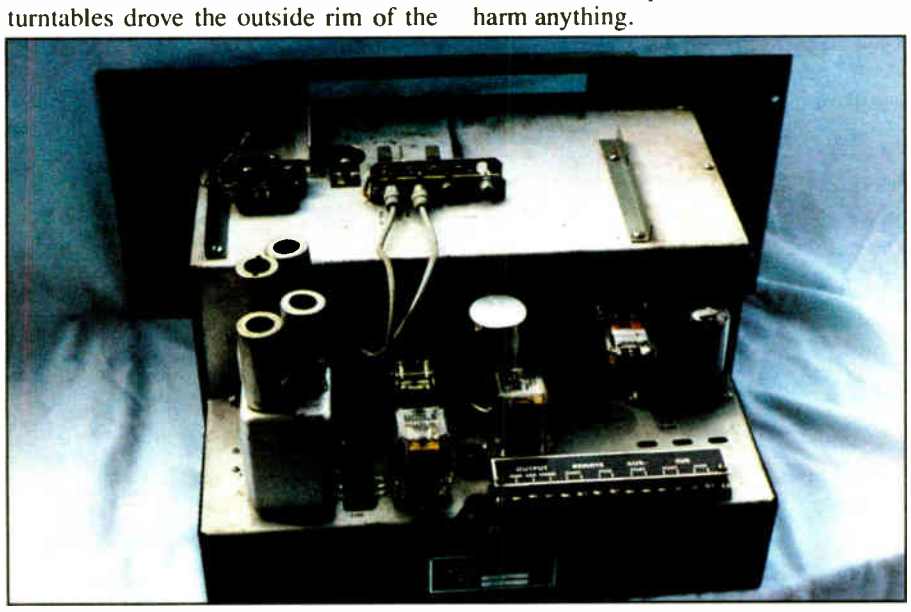
Tom Vernon is a multimedia consultant in Philadelphia.

Reach him at (717) 367-5595 or at TLVernon@blazenet.net

Fig. 2



Real-world representation of motor pulley/speed relationship (note effect of belt thickness on calculations)



This 1963 ATC/Collins cart machine needed careful attention to the mechanical drive system in order to restore it to operating condition

Products & Services Showcase

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Hafler

▶ Continued from page 37

did not saw one open, but a representative at Hafler said strategically placed internal bracing reduces wall flexing and mid-bass resonance. I will take their word for it.

The thick cabinet walls and the high rigidity also improve mid-bass coupling. The M5 is designed for small console, workstation or meter-bridge applications.

Product Capsule:
Hafler M5 Passive Monitors

Thumbs Up
- ✓ Hefty construction
- ✓ Flat response
- ✓ Switchable -3 dB tweeter L-pad
- ✓ 200-watt rating

Thumbs Down
- ✓ No grille or provision for one
- ✓ No mounting holes, brackets or guidelines

For more information contact Hafler in Arizona at (888) 423-5371 or visit the Web site at www.hafler.com

The 5.25-inch mid-bass driver is custom-designed and manufactured for the M5. According to the manufacturer, it provides fast and efficient low-frequency damping and uniform piston control while minimizing intermodulation distortion components.

This driver uses a long 1.25-inch diameter voice coil set in a computer-optimized magnet structure. It can handle up to 200 W.

The M5s tweeter employs a proprietary 25 mm silk dome and exponential horn waveguide combination. A Hafler representative said this exponential horn loading "locks in" the width and depth of the soundstage. A front-panel rocker switch allows the user to select flat or -3 dB control in tweeter output.

Gary Church, chief acoustic engineer for Hafler, said, "The M5 high-end is exact and honest and reflects what was actually heard during a monitoring session, whether live or recorded. In order to maintain the integrity of the M5 system, it was designed and voiced to compare alongside the Hafler TRM8 and TRM6 active monitors."

He said the M5 is an easy load to drive with anything from a Hafler P1000 to a 9505.

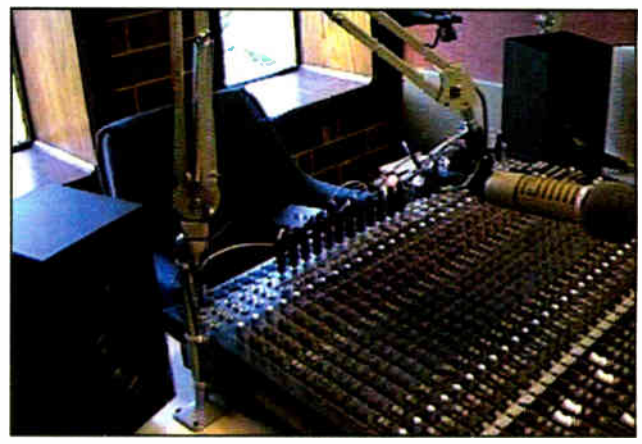
The crossover network used in the M5 uses a symmetrical fourth-order Linkwitz-Riley passive filter set at 3.2 kHz. This sums both high- and low-pass filter sections to a flat magnitude response and allows both drivers to be wired in the same polarity.

The 3 dB tweeter pad is integral to the high-pass section of the crossover. All the capacitors used in the crossover are high-quality polyester film types and all inductors are low DCR air-core types.

In my test, I fed the pair of M5s with about 25 W RMS with an air monitor feed. I chose to use this rather than a studio mix because I am intimately familiar with the sound of the station's air-chain with all kinds of source material and on many different types of monitors.

I found the resulting sound to be flat within the range of my hearing. I could detect none of the low-end coloring that is prevalent with other relatively small monitors. The midrange was clear and the high end was transparent and crisp.

For only $299 list each or $598 for the pair, the M5 is an excellent monitor to use for evaluating a station's on-air sound. By the same token, a studio mix that sounds right on the M5 will, no doubt, sound right after passing through an air chain. The M5 is sold individually for putting together a 5.1 system without a subwoofer.



A pair of M5s in the test environment

There was none of the "coloring" of the sound in the studio mix as a result of unfaithful monitor sound reproduction that is so common to other monitors.

■ ■ ■

Cris Alexander is the director of engineering for Crawford Broadcasting.

At $598 per pair, the M5 is suitable for evaluating your on-air sound.

Products & Services Showcase

◆ PRODUCT GUIDE ◆

Products for Radio Air & Production Studios

Mail info and photos to: RW Product Guide, P.O. Box 1214, Falls Church, VA 22041

Digital Monitor Newest Addition to Nanoamp Series

A new addition to the ATI Nanoamp series is the DM200 digital monitor and converter for $599.

The unit occupies 1/3 of a rack space and accepts loop-though AES/EBU format digital audio by XLR, BNC or RCA connectors.

Input sample rates of 32, 44.1, 48, 88.2 and 96 kHz with word lengths up to 24-bits feed a stereo headphone amplifier, balanced line outputs and a stereo LED meter.

The stereo LED meter displays in PPM. The meter is switchable between the D/A converter output indicating 0 dB full-scale down in 3 dB steps and line output level with 0 dB equaling +4 dBm.

LEDs also show the sampling rate and another LED called "valid" indicates that there have been no data or transmission errors.

For more information contact ATI in Pennsylvania at (800) 959-0307 or visit the Web site at www.atiguys.com

Mediatron Expands Radio Software Lineup

AirControl NT 2000 Professional, mediatron's new version of its large-market radio automation and integration system, has new plug-in tools such as automated time announcement and VoiceTracking Gold with hardware faders and effect tracks for surrounding elements.

Also, the new MediaStation system is an FM-, DAB-, e-commerce- and Internet-ready live-assist and automation system for small- to medium-market stations that works with SoundBlaster-compatible soundcards.

MediaStation supports third-party traffic and music scheduling software, or it can use mediatron's built-in software, AirPlan for traffic and AirSelect for music.

Both can be used as standalone products.

WebSt@tion is designed for Internet broadcasting and supports standard mediatron plug-ins. It features e-commerce and dynamic Web page updates.

Mediatron software has been tested to run on Windows 2000 Professional.

For more information contact Ron Mitchell in Illinois at (800) 779-7575, via e-mail at ron@mediatron.com *or visit the Web site at* www.mediatron.com

USER REPORT

KJEM(FM) Makes Impulse Purchase

Arkansas Engineer Huffmaster Finds Harris/PR&E an Uneventful Installation

by Zeb Huffmaster
Chief Engineer
AMFM Radio

FAYETTEVILLE, Ark. I could say I'll always remember the day I installed my new **Harris** Impulse Digital Console from **Pacific Research and Engineering**, but I won't.

The installation was so uneventful that I barely remember it now.

It was one of the easiest installs I've ever done. There were no external black boxes to worry about — no converters, logic control interfaces or unwieldy relays and connectors to tie things together.

The Impulse came as close to "plug-and-play" as any console I've ever worked with.

That's good, because I installed it on President's Day when almost everyone else at the station had the day off.

Off without a hitch

I had everything configured and labeled for the jocks when they came in for work on Tuesday and did a 10-minute review of the equipment for them. I didn't get a single call with questions the entire day. As easy as it was to install, the Impulse was just as easy to use.

The 'Jon and Zach' morning show uses the Impulse

It's also versatile.

All-day use

At KJEM(FM) in Fayetteville, better known as 93.3 "The Eagle" classic rock, we use the Impulse as our on-air console for every daypart except the morning show.

In the morning, it serves as an integral part of our WAN-casting system for "The Jon and Zach Show," which is also heard on KZBB(FM) "All Hits 98," Fort Smith, Ark., and KZCD(FM) "Z94 Rock," Lawton, Okla.

The Impulse acts as our "bit factory" for the morning show. It has unique features you would only expect to get in more expensive consoles. The device gives Jon and Zach the versatility they need to handle a mix of sources, do interviews, direct contests, manage callers and even do post-production.

Simultaneous feed

The Impulse's three stereo program busses mean they can feed separately the KJEM air chain, recording equipment and audio to callers simultaneously.

The two telco inputs and mix-minus outputs make call-in contests a snap. The autofeed feature on the phone interface makes it easy to route mic audio as well as contest audio and sound effects to callers.

Jon Williams with the Impulse Console

Harris Impulse Digital console from PR&E

Fayetteville is a small market and we don't have big budgets. It occurred to me that with all of this functionality — and the fact that the Impulse is fully digital — that it would spell "major expense."

Economical

Yet after looking at a variety of both analog and digital consoles, we found the Impulse economical. In fact, it was less than the cost of many analog consoles.

Even though we didn't need a fully loaded digital console, the Impulse can accept either analog or digital inputs and reconfigure from analog to digital easily. So it only made sense to put in a console that could serve a dual purpose if it wasn't going to cost us any extra.

The Impulse
can accept analog or digital inputs and reconfigure from A to D easily.

Since I've installed the Impulse console, I haven't had to think about it and I've received no negative comments from the jocks. It sports exactly the kind of quality manufacturing and full-featured performance I've grown to expect from Harris and PR&E.

For more information contact Harris in Ohio at (800) 622-0022, fax (513) 701-5306 or visit the Web site at www.harris.com

RADIO broadcast products

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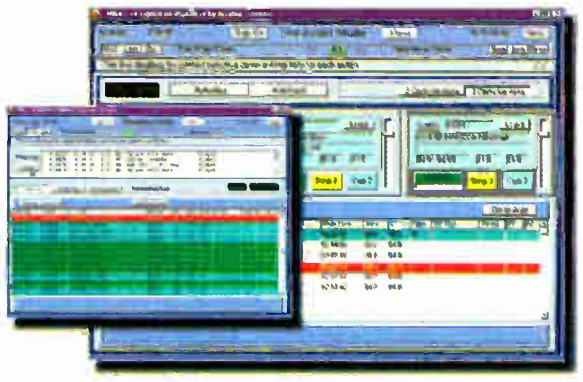

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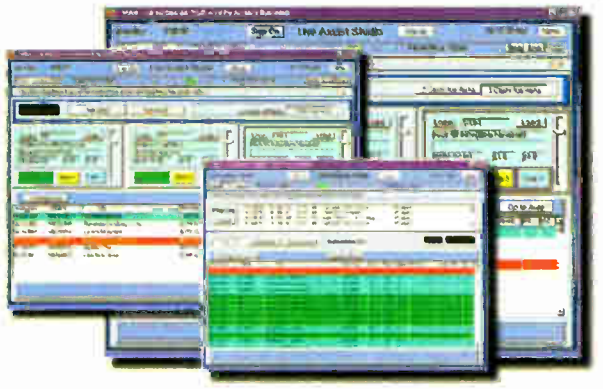

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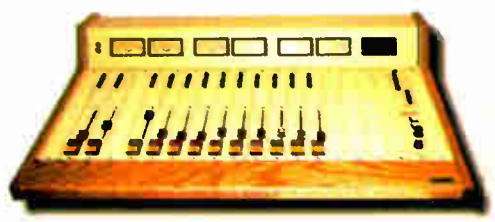
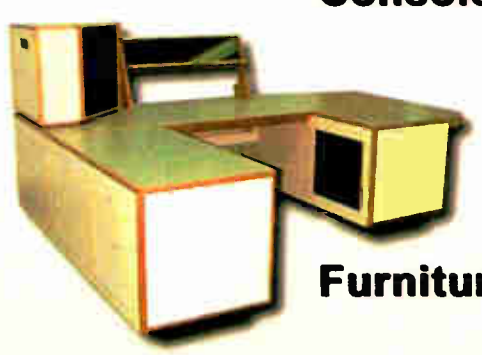


Consoles



Furniture

USER REPORT

Vadis Enters Company Arsenal

First Broadcasting Management Installs Klotz Console

by David Gates
VP, Station Development Division
First Broadcasting Mgmt., LLC

DALLAS First Broadcasting Management is a company that has traveled several paths.

We first owned two radio stations, KSFO(FM) and KYA(FM) in San Francisco, before relocating to Dallas to set up a radio network. In 1997, we decided to abandon that trek due to the economic liability that is bestowed on a network. First Broadcast now specializes in working with FCC license holders to increase the value of their radio stations.

Soon after, we decided it was time to purchase two consoles for our on-air studios, one of which is a backup studio. After looking at several options, we chose the Vadis digital platform and DC digital console from **Klotz Digital.** The flexibility of the console and Klotz's reputation for quality were big factors in our decision.

Essentially, our Klotz system comprises the Vadis platform, a rack-mounted digital control system and switcher, plus the Vadis DC consoles that extend some distance from the rack.

We can wire the system so that any device in our facility wired into one of the consoles will appear on the other console. One piece of fiber-optic cable and one twisted pair of copper were all it took to accomplish this setup.

Multiple configurations

Furthermore, multiple configurations for the console can be programmed and then switched on the fly. For example, the morning drive team may need to use the console's faders in a certain configuration due to many different sources — comedy bits, traffic, weather, sports and news may all need to be configured into that particular show.

David Gates at First Broadcast Managment with the Vadis DC digital console

The midday program, however, may have different needs. That operator can change the configurations easily for his or her needs.

When the transition is made, the operator simply punches a button that changes the configuration. The on-air transition is seamless. Jumping, clicks and pops are nonexistent.

Theoretically, every radio announcer can have his or her own setup of faders; some can have their CD players on the left and their music system coming off the hard drive on the right and vice versa.

Flexible

The Klotz system is extremely flexible.

Our most recent use of the system was when we sold a Class C station to an ABC Radio affiliate, KNKI-FM in Dallas. We provided that station's programming for approximately four to six weeks after the purchase.

As we are now a specialty business, we are seeking out projects across the country that match our objectives. Some of the license holders we will work with in the future may need First Broadcast to assist with programming.

With these possibilities in mind, we continue to retain the capability to provide programming for any one or several projects with our facilities here in Dallas.

When we use the system, it is productive, mainly because of its flexibility as well as its ability to route things in a flexible manner. When we wanted to perform maintenance, we could leave the console set up so that the control panel and the equipment rack were operating and accepting program material on a pass-through basis while working on the console's main frame.

This was more important for us than we could have imagined; it allowed us a level of flexibility not normally available with a standard console. We used this feature often during the time we provided programming to ABC.

The efficiency of the Vadis platform is a high point. With this system, we were able to reconfigure from Network to Local Station Operation so we could provide programming to ABC. This efficiency will serve us well regarding future projects for First Broadcast.

The technical support from Klotz has been exceptional. We requested a slightly different fader algorithm than what comes standard because we wanted a milder gain slope at one point in the range of the fader. Klotz literally flew two people to our site to put a different algorithm in for the faders.

They managed to retain the entire gain of the fader and provided us with a slope we liked in the particular "sweet spot" of the fader. This setup is a little more gradual then the standard configuration.

Klotz goes to exceptional levels to facilitate good communication. It is rare today to find a company that will go to these lengths.

Other than that, there has been no need for technical support; these consoles run with little or no problems. The money we have invested in them is money well spent and we have enjoyed their reliability, which is efficiency in and of itself. They are quite dependable.

Our Klotz Vadis system is first-class. The more I have come to understand the Vadis platform, what it is about and why it does what it does, the more I appreciate it. The key is taking the time to learn these aspects. It is more than worth the effort.

For more information contact Klotz Digital America Inc. in Georgia at (678) 966-9900, fax (678) 966-9903 or visit the Web site at www.klotzdigital.com

USER REPORT

Logitek Gets EXCL's Engines Running

by John Buckham
Chief Engineer
EXCL Spanish Network

CAMPBELL, Calif. When EXCL Communications decided to move to a new, larger network facility, I was charged with building the studio facility. We were to have 10 studios, four of which were to be used for programming and six to be used as production rooms.

I was searching for new consoles when I saw **Logitek**'s answer to a versatile digital console. As I examined the technical details of the console, I was impressed by the thoughtful implementation and versatility.

Splitting up the boxes

Logitek uses a different approach.

The "console" is a rack-mount box named Audio Engine which houses the power supply, DSP board, control board and your choice of mix-and-match analog and digital interface modules.

Each module has four stereo inputs and outputs. Up to eight interface modules may be added and three control surfaces may be used on one Audio Engine.

Radio Super Estrella on-air studio with Logitek's console control surface

A PC running the supplied software handles configuration. We use an IBM Think Pad laptop with satisfactory results.

The Windows software is easy to use. Once we got the hang of it, we assigned inputs and outputs by clicking and dragging in the program. To assign an input you first label the input, then select the connector pins you wish to use.

Users also can add the channel to a mix-minus bus or add control relays for machine control or on-air lights.

Analog domain

In the analog domain users can adjust the gain, among a host of other useful functions. Outputs are handled in a similar fashion. Once setup is complete, the configuration can be saved or downloaded to the audio engine.

Before downloading the configuration, the program will check the setup for errors and, when all is ready, downloaded. It takes about 20 seconds, then a complete reset is performed and the system is up.

Anyone can give it a test spin by downloading the configuration software from the Logitek Web site.

To control the audio engine, users can operate a PC with the optional V-Mix software that gives customers a Windows-based graphical control surface operated by a mouse or touch screen.

There are two hardware options: the ROC control surface, available in five or 10 fader versions, and the deluxe NuMix modular control surface in which you can add faders six at a time.

Here at EXCL we opted for the ROC-10 control surfaces. The control surface can be separated from the audio engine by up to 1,000 feet, using CAT-5 wiring. The interface is robust.

The ROC-10 control surface is an engineering dream. If something is spilled into the control surface it can be disconnected from the audio engine for repairs without affecting what is on the air.

Of course control will not be possible without a control surface. (V-Mix software can serve as a backup.)

All of the illumination on the ROC is via LED. There are no incandescent lamps to burn out and channel identification uses small backlit LCD panels. VU meters are large bright three-color LED units including VU and Peak indications that are hard to ignore.

Operation is quite straightforward with little learning curve for on-air personnel. To make a change to a channel, press the "change" button over the channel. Press Mode, Input or Bus buttons on a fader and a corresponding LED will illuminate. Then the mode change knob is rotated until the desired setting is displayed in the LCD.

To make the selection active, press the "take" button. It's done. In the configuration program, the various functions and inputs can be assigned to each channel as required. Users can assign as many or as few selections to each fader as required.

The program and audition bus are assigned by a pushbutton with an LED indicator; other buses are available through the bus pushbutton as required. On and Off buttons are available at the bottom of each channel as well as a cue switch. Cue can be configured in the setup program to be fader "click-down," by the button or both.

On and Off buttons can be configured to switch as the fader is raised.

Monitoring for the control room, phones and studio are large knobs that operate a digital encoder. Because the rotation is continuous, the monitor "pots" are less likely to sustain damage from overzealous air personnel. The monitors can be assigned to any input on the board as well as inputs, such as off-air.

The console does not have an internal headphone amp. In order to be used, the headphones must be routed out of the Audio Engine to a headphone amp. We used the Benchmark Media units with satisfactory results.

EXCL's master control/uplink rack room with 10 Audio Engines

There are no mic preamps in the Engine. Although Logitek sells a mic pre for use with the audio engine, the Audio Engine inputs are line-level only. We are using the PreSonus M-80 eight-channel mic preamp instead with the ACP-88 processor-and enjoying sublime performance from these excellent mic chains.

Testing the waters

When I received the console, I set it up at our 50 kW AM transmitter site where the RF fields are high. Before the move we had all of our studios at this location. I can tell you that more than one console we tried would not meet spec when at this location because of RF ingress.

This was not the case with the Logitek. I first strung 50 feet of control cable across the floor between the control surface and audio engine with no effect at all.

I also ran a 50-foot length of AES/EBU digital cable from a Denon CD player to the console with no loss of performance. The rejection of RF on the analog inputs was only fair in the 50 kW field, though I have seen much worse, to Logitek's credit.

When we constructed the new EXCL facility, construction was progressing as the studio wiring was being completed. During this time the Logitek equipment was running on temp power, along with power saws, compressors, drills and other construction-related equipment.

The quality of power at the job site was horrible. I set up my DVM to record maximum and minimum voltages. A low of 55 volts and a high of 140 were recorded over a one-hour period. Although the Audio Engines will not run on 55 volts, they never failed to re-initialize and come back online when the electric mayhem stopped. They never lost programming or malfunctioned after the fact.

Speaking of initialization, the Audio Engine requires less than five seconds, so there is no extended reboot time.

To sum it up, I will not hesitate to recommend the Logitek system. After three weeks of broadcasting, we have not seen any unusual conditions.

Audio quality is very good and our personnel have had no problems adapting to the consoles. Logitek has a winner on its hands and perhaps this is the shape of things to come.

For more information contact Logitek in Texas at (800) 231-5870, fax (713) 664-4479 or visit the Web site at www.logitekaudio.com

TECH UPDATE

Ward-Beck Designs R2K/8 for Rack

Designed for small-scale applications, the **Ward-Beck Systems** R2K/8 rack-mount console model uses the same modules as the larger desk-mount models of this console line.

The R2K/8 occupies eight rack units (14 inches) and is designed for remote and/or news-packaging applications.

The R2K/8 has eight input module slots. These will accept any of the current input module types, R201, R207 or R221. Input slots one and two may also be used for the R205, 8x2 stereo-line selector. The R2K/8 offers four stereo output buses (P1, P2, P3 and P4) as well as two mono auxiliary buses M1 and M2.

The R2K/8 has an integrated power supply and cue speaker. Both the LED bargraph meter on the R206 utility module and meter selector on the R203 Control Room monitor module allow console program levels as well as an Off-Air feed to be metered. Adding a Ward-Beck MP meter panel equipped with moving needle meters can enhance the unit.

For more information contact Ward-Beck Systems in Ontario, Canada at (800) 771-2556, fax (416) 335-5999 or visit the Web site at www.ward-beck.com

USER REPORT

WGET(AM) Gets Autogram

by Larry E. Angle
Chief Engineer
WGET(AM)/WGTY(FM)

GETTYSBURG, Pa. Six months ago, an **Autogram** PM228 console was selected by WGET(AM) as a replacement when its old console became too small for the complex requirements of music and many satellite feeds.

The PM228 is the latest in the Pacemaker series from Autogram. Forty-eight inputs are available with the present configuration. The built-in headphone amplifier provides enough power for even the most demanding jock.

Selecting the Pacemaker by Autogram was based on 40-plus years of working with broadcast equipment. Cost was a serious consideration but the proven reliability of Autogram consoles, in these years of round-the-clock calls for assistance, was the deciding factor.

As a high school teacher once reminded his classes, "Quality leaves no regrets."

Continuing family tradition

For WGET and WGTY(FM), this is the third member of the Autogram family now in use.

Our IC-10, which is 15 years old, and RTV-20 (14) are in pristine condition and performing with superb results.

Quality is an attribute built into these consoles.

The PM-228 was installed in less than four hours. The miniature input/output connectors made installation easy and reliable, allowing for input swapping after the jocks make changes in preferences.

No special tools are required for the installation of the Pacemaker, however, a wire marking scheme should be used for tracing the many inputs. Although WGET does not use digital audio through the console, this function can be optionally added in the future, if the need arises.

The built-in headphone amp provides enough power for even the most demanding DJ.

All amplifier cards use on board jumpers and dip switches to allow for custom configuration of input levels and terminations. These boards can be removed and inserted while the console is on the air, with no pops or clicks — the metering bridge opens to allow access to the cards with little disturbance to the jocks.

Quality components are used throughout the Pacemaker console, including mechanical push-button switchers used on input modules and the ever-rugged P&G faders. The On/Off pushbuttons for each module use bright LED illumination and were a hit with operators. No more pesky lamp replacements.

The functional layout of the operating panel is easy to learn. Our P-Touch label maker, producing half-inch black lettering on a clear background, added a professional touch to the appearance to the console.

The metering bridge displays program, audition and Mix-Minus bus metering necessary for the many functions of day-to-day operations.

It is apparent that the standards established years ago with the RTV-20 and IC-10 by the Autogram folks have not been compromised. The company is still providing parts and service for those units. We feel safe in the knowledge that we will be able to call the factory for years, talking to the designers of the equipment, and have the ability to service the products. This a comforting thought in this day of corporate takeovers.

For more information contact Autogram Corp. in Texas at (800) 327-6901, fax (972) 423-6334 or visit the Web site at www.autogramcorp.com

USER REPORT

NuStars Rise at Entercom Stations

Entercom's Buffalo-Area Stations Install 11 Audiotronics Consoles in Cluster

by Tom Atkins
Director of Engineering
Entercom

BUFFALO, N.Y. Entercom's six-station cluster in western New York, formerly owned by Sinclair, underwent a complete renovation — including a move to new studios — this past winter.

The group boasts some real gems in the Buffalo market, including four cornerstone AM stations: 50 kW WWKB(AM); all-sports WGR(AM); news/talk WBEN(AM); and WWWS(AM) playing ABC's urban gold satellite format; plus 100-kW "Star 102.5" WTSS-FM and "Kiss 98.5" WKSE(FM).

When we began the four-and-a-half-year project, the stations were spread out in four buildings; now we're consolidated into one new location built from the floor up.

Do it right

Taking time to do this move right gave me a chance to plan and design for quality and efficiency. We put in 95-percent new equipment, including 11 **Auditronics** NuStar digital consoles for the control rooms and production studios.

Our previous consoles were more than 20 years old and we knew we had to replace them when we made the move. The question was, "Do we need digital consoles?"

Our solution was to install consoles that could handle both analog and digital signals so we could keep up with an increasingly digital radio environment.

We decided we would need a console that would handle AES digital but still provide analog inputs — because more of our sources remain analog for the time being. It was critical to find a console that would not be obsolete in a couple of years.

It was also important to choose a digital console that had a track record of experience, one where any early "bugs" would have already been worked out. We chose the Auditronics NuStar because it was the first on-air digital console introduced into the marketplace.

Weathering the changes

In December of 1999, our stations were acquired by Entercom, but by then the project was well enough along that the change in ownership really didn't have much affect on our plans. But by the time we went from initial planning to installation, another major change had taken place: Wheatstone had acquired Auditronics.

At first we were concerned about whether Wheatstone would support the NuStar console. They reassured us they would.

True to their word, they not only maintained the product line but also have actually added to it with new model introductions. So we knew we would have the manufacturer support we required.

This February, it was full speed ahead for the move. We installed the 11 NuStars. Our stations tried to outdo one another – making the transition from old studio to new on-air, during drive time — with antics like a wireless remote with the "Kiss 98.5" morning team riding the seven miles from one studio to the other on bicycles.

In all, the changeover was seamless and the consoles performed from the first instant.

I have set up the 11 NuStars in each station's control room and production studio (except for satellite-formatted WWWS, which doesn't have a control room) to be nearly identical, so that one studio can act as a backup for another if the need should arise. It also allows the staff handling production to work in any room and maintains a standard of quality throughout the facility.

I am particularly impressed with the extremely short digital delay of this console. Normally you would expect an A-D/D-A delay much longer than the one we've experienced.

The NuStar is laid out like an analog console and our jocks, producers and announcers seem comfortable with its operations. There was some adjustment to improvements made over our boards from the 1970s, but it only took a few hours to get everybody up to speed.

WTSS-FM's KISS morning show bikeathon: (left to right) Nicholas Picholas, Wease and Janet Snyder

I like the fact that NuStar has a separate card cage, a DSP processing unit that allows users to set it up in a location outside the studio. We thought about planning the rooms around a central control area, but in the end it was more convenient and made more sense for us to locate the DSP unit in the same room as the console interface.

The modules are "hot-swappable" — a feature we may need to employ some day, but haven't so far. I like the durable switches, the consoles' P&G faders and the jocks like the EQ control for headphones.

Some nice features have been built in to the NuStar, including Mute on each module. The on-air staff can mute callers. This comes in handy with one of our call-in talk shows. The Mix bus assign is great — the talent likes being able to assign mix-minus to whatever module they want.

The NuStars integrate well with the rest of our equipment and there has been a noticeable quality improvement with comments from listeners about the better on-air sound. We had static electricity problems with some of our rooms during the dry winter months, but Wheatstone was helpful in identifying the problem and suggesting solutions.

Most important, we feel we have consoles that can grow with us and won't be obsolete too soon. Our predecessors had the foresight to put in versatile, durable equipment back in the 1970s that served us well for many years. Now, with our redesign and equipment choices, we feel we've done the same for our future.

For more information contact Wheatstone at (252) 638-7000, fax (252) 637-1285 or visit www.wheatstone.com

Our solution was to install consoles that could handle analog and digital so we could keep up with an increasingly digital radio environment.

TECH UPDATE

LPB Touts Being Blue

LPB's Blue 5c, a winner of Radio World's Cool Stuff Award, is an on-air console.

At five pounds, Blue 5c offers RJ-45 connectivity, 10 stereo inputs, five stereo channels, stereo program and cue busses, mono telephone bus, remote starts, monitor muting and two headphone amps.

LPB designed the 5c in anticipation of demand for consoles with standardized input connections, smaller sizes and lower prices.

For more information contact LPB Communications Inc. in Pennsylvania at (877) LPB-COMM, fax (610) 644-8651 or visit the Web site at www.lpbinc.com

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USER REPORT

KBVR(FM) Moves Into Digital Age

Oregon State University's College Radio Station Installs Studer On-Air 2000

by John Glass
Chief Engineer
KBVR(FM)/KBVR-TV

CORVALLIS, Ore. Last summer, when we installed the **Studer** On-Air 2000, at Oregon State University's KBVR(FM), listeners immediately took notice of the improved sound.

It was obvious that we had a cleaner, better-sounding signal with virtually no distortion. I had expected a big improvement because the 2000 has stringent audio specifications, but it's impressive just how close to being transparent the sound is now.

With most program material it's very difficult to tell the difference between the program bus and the off-air feed from our monitor tuner (an audiophile-grade Carver TX-11).

Like virtually every radio station in the United States, KBVR has been making the transition from analog to digital. That has meant searching for all of the puzzle pieces that allow the changeover to occur in orderly stages, according to a timeline and budget that meet KBVR radio's needs and resources.

Finding the right digital console was a key piece of the puzzle.

KBVR is a student-operated radio station that offers an eclectic assortment of music programs, including alternative rock, jazz, folk and classical, plus some news and public affairs programming.

The permanent staff includes a faculty advisor, office administrator and me, but the station is really run by the 80 or so students who fill all other positions. KBVR also operates a separate television station.

We had been looking for a new console to replace the 14-year-old Radio

See KBVR, page 52 ▶

Photo by Tina Hutchens

Student DJ Jenn Laharty with the Studer On-Air 2000 console at KBVR(FM)

The touchscreen system allows us to build different access levels, from basic to advanced DJ and engineering modes.

TECH UPDATES

Clark Helps Engineers Design Wiring

Clark Wire & Cable is releasing a software program for facility wiring.

The program, called Clark Custom Design, is designed to take the place of previous CAD programs. It will allow an engineer to design any type of panel, then place connectors on it, type in custom designators and print it out for in-house use.

The software will be available as a free service from Clark Wire & Cable's Web site. Engineers can log on to the Web site, access the custom drawing section and utilize the program.

The program will be available in early to mid-August.

For more information contact Clark Wire & Cable in Illinois at (800) CABLE-IT, fax (847) 949-9595 or visit the company Web site at www.clarkwc.com

Mager Prewire Service Available

Mager Systems' Turnkey Prewiring service for its studio cabinetry offers engineers the opportunity to avoid wiring cabinets themselves.

Mager designs and fabricates custom furniture for broadcast applications, including radio studios. Solid-wood construction, custom tops and finishes and three-dimensional drawings are among the services and products the company offers.

Mager's solid-surface tops carry a 10-year warranty. Delivery, installation and the prewiring service are available to U.S. customers.

For information contact Mager Systems in Arizona at (623) 780-0045 or fax to (623) 780-9860.

Arrakis Sparks A Revolution

Arrakis' Colorado Digital Revolution REV-12P console is touch-screen compatible and features 24 inputs into 12 mixers. It includes Cool Mix Software and announce booth/news room Turret Software for use on your PC.

The REV-12P joins the REV-12C, REV-18C and REV-18X in the Colorado Digital Revolution line. All Arrakis consoles use Penny & Giles faders.

Revolution consoles have optional next-business-morning replacement service for the digital engine. Furthermore, the Revolution can be purchased with return privileges.

For more information contact Arrakis in Colorado at (970) 224-2248 ext. 312, fax (970) 493-1076 or visit the Web site at www.arrakis-systems.com

KBVR

▶ Continued from page 51

Systems ESA-10 analog board at the radio station. We knew we wanted a digital console, but it had to be compatible with all our old analog sources and expandable well into the future.

Easy choice

We considered a number of digital consoles, most notably those manufactured by Wheatstone and Calrec, as well as the Studer On-Air 2000. All three are wonderful boards, but the On-Air 2000 ease-of-use, flexibility, competitive price and its clear, clean sound — which is the great promise of digital broadcasting — made the choice relatively easy.

One thing that immediately impressed the students when they first had a chance to sit down with the On-Air 2000 at NAB2000 was how intuitive it is.

The touchscreen system allows us to build different access levels, from basic to advanced DJ and engineering modes. We've been able to take people with no radio experience and get them up-to-speed in a very short time.

We've been able to take people with no radio experience and get them up-to-speed in a very short time.

Another thing we especially appreciate is the flexibility offered by the On-Air 2000 modularity.

We originally had our console configured with all the mic modules on one side, but sometimes we have shows with two DJs. In those cases, we need mic modules at both ends of the board. Accomplishing that is as simple as pulling a module from the back of the console and swapping it into another position.

She's a beauty

One of the beauties of a modular console like the On-Air 2000 is that you can reconfigure it at the drop of a hat.

Something else impressed us when we were making our decision on which digital console to buy. We wanted to test and compare the boards we were considering by having a side-by-side "shootout" between them.

Studer was the only manufacturer that stepped up to the challenge and let us try the On-Air 2000 before we bought it. That clinched it.

For more information contact Studer at (510) 297-2711, fax (510) 297-2785 or visit the company Web site at www.studer.ch

Photo by Tina Hutchens

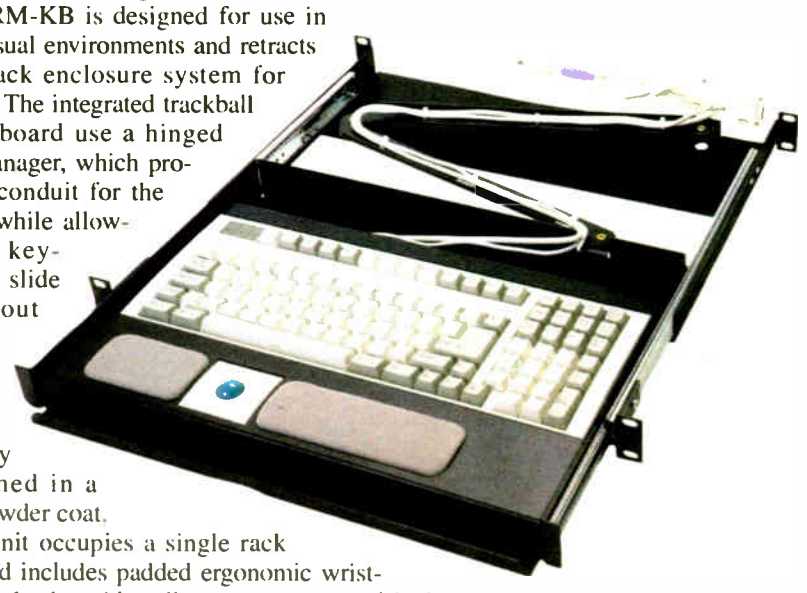
Student DJ Kelly Cutler with the Studer On-Air 2000 console at KBVR(FM)

TECH UPDATE

Middle Atlantic Designs Space Saver

Middle Atlantic Products RM-KB is a rack-mountable, 101-key computer keyboard with an integrated trackball.

The RM-KB is designed for use in audio-visual environments and retracts into a rack enclosure system for storage. The integrated trackball and keyboard use a hinged cable manager, which provides a conduit for the cabling while allowing the keyboard to slide in and out of the rack.



The sliding rack tray is finished in a black powder coat.

The unit occupies a single rack space and includes padded ergonomic wrist-rests. The keyboard installs to a system out of the box.

For more information contact Middle Atlantic Products in New Jersey at (973) 893-1011, fax (973) 839-1976 or visit the Web site at www.middleatlantic.com

USER REPORT

Audioarts Gives KKJO Big Sound

by Jay Thouvenell
Director of Engineering
Eagle Radio

ST. JOSEPH, Mo. The year 2000 brought about an abundance of changes for hot AC KKJO(FM) and its sister stations in St. Joseph, Mo.

For one thing, we switched frequencies from 105.1 to 105.5 to make room for another allocation. At the same time, the stations were acquired by Eagle Communications and underwent a studio consolidation.

It was time to upgrade our 20-year-old Collins console.

With the frequency switch, KKJO also moved 15 miles west of its previous location and nearly doubled its tower height. The result is increased coverage into the Kansas City radio market.

A new console that would update our equipment and provide a quality on-air sound was crucial to our studio construction. Keeping in mind all the changes and the potential to gain more listeners in a bigger market, I went to last year's NAB Radio Show looking for a console with the most features that would be affordable to our new management.

Originally, I set my sights on the **Audioarts** R-60. But when I saw what the **Wheatstone** engineering team had put into the RD-20 digital Audioarts board introduced at the show, I knew I had my new on-air console.

More expensive consoles

What impressed me the most about the RD-20 was the high-quality features packed into a simple, modular design that would require only minimum training to operate. I was trying to approach the quality of those stations that spend considerably more on their console purchases. With the RD-20, I felt we could get most of the same features at a lower cost.

In fact, there are many stations still spending money on high-end analog consoles. The RD-20 lets us approach those features and quality within our budget.

The digital quality of the board gives it an appreciable clarity and a pristine on-air sound.

The RD-20 has three output busses. Its digital signal is flexible, meaning it supports several sampling rates, user-selectable at 32, 44.1 or 48 kHz. Because we also put in digital processing, compatibility was important. The RD-20 digital outputs allow us to maintain a digital signal from sources such as CDs all the way through the composite out on our processor.

The console has three stereo busses with both digital and analog outputs. It accepts both digital and analog inputs; its digital inputs can be AES/EBU and S/PIDF. The digital inputs from our CD players as well as our hard-disk system are using the console's digital inputs and are performing beyond our original expectation.

Our on-air talent like the layout of the board and find it user-friendly; it looks clean and non-intimidating. As I hoped, the jocks took to it with little training.

Quick, to the Superphone

One feature we like in particular is the two-caller Superphone module. It interfaced easily with our telephone hybrid. I hooked it up and a short time later it was completely assembled with all the settings ready for use. In fact it took such a short time that we thought, "It can't be this easy!" But it was.

The board can derive a mix-minus feed from any bus — Program, Audition or Utility — and assign the caller to any of those same buses.

Because it's a dual-caller module, we can mix several callers on-air, with a mix-minus for each. It makes two-contestant contests possible, and is a lot of fun on air.

The on-air staff liked the metering. They were accustomed to analog meters but the RD-20s are LED and the staff have adapted with no problems.

Bob Heater (foreground), PD, KKJO, discusses the RD-20 with Jay Thouvenell

It's a dual-caller module, so we can mix several callers on-air, with a mix-minus for each. It makes two-contestant contests possible.

Audioarts has designed the meters to be high-brightness and fast-acting and most of the jocks actually prefer it this way, now that they've had some experience with them.

The console has selectable timer restarts and many features you usually only find on consoles well above its price range. Also appreciated by the on-air staff is the console's attractive appearance — the elegant beige color of the modules and its oak trim.

While we engineers tend to choose equipment based on a company's reputation and what works, it's good to have a nice-looking console everybody can be proud of.

The installation of the RD-20 was straightforward. When we had questions or special applications, we were able to talk at length to the folks at Wheatstone and get the support we needed.

We put the RD-20 on the air at the end of April and have not had any problems with it. We got some good feedback on the improved sound; our new CEO was in town the day it went on and immediately noticed the quality. That was a great way to convince management that we bought a quality piece of equipment while keeping an eye on the bottom line.

Jay Thouvenell is an SBE-certified broadcast engineer and is director of engineering for Eagle Radio, which owns 18 stations in Kansas, Nebraska and Missouri.

For more information contact Wheatstone in North Carolina at (252) 638-7000, fax (252) 637-1285 or visit the Web site at www.wheatstone.com

Products & Services Showcase

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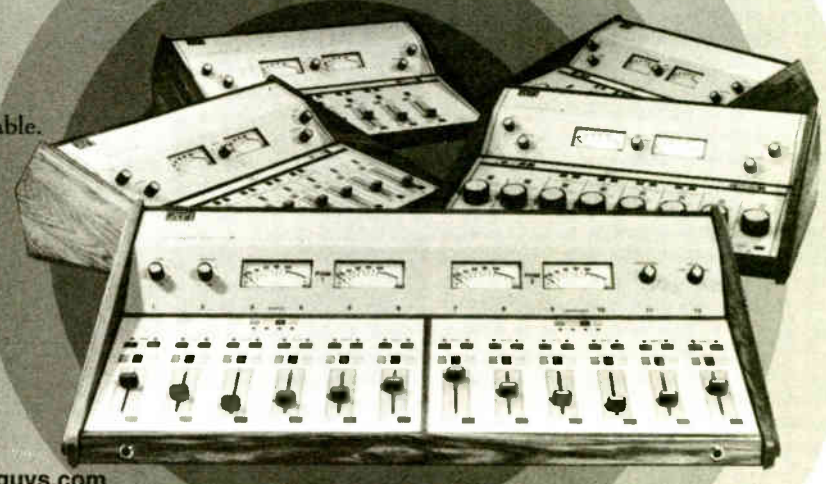

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TECH UPDATES

Wheatstone Releases D-700

The D-700 console from **Wheatstone** can store 99 user presets, allowing it to memorize console configurations including bus assignment, EQ, send levels, source selection, display titles and ON/OFF status.

Settings can be stored for individual users and dayparts, as well as daily or seasonal events. The preset saves extend include input channel controls as well as settings on the central EQ/Dynamics panel, so that on-air talent can recall individual compression, EQ and phone settings.

The D-700 has a more powerful master control module than previous versions and an additional output module, giving every channel two stereo auxiliary send controls. Each of these may be pre- or post-fader and pre- or post-ON/OFF. This gives the D-700 capability for production purposes or as a back feed/IFB system.

The console has been designed with a multilevel security system, giving each operator a code and level of access and preventing unauthorized editing of pre-sets and router sources, while the engineer retains master control. Functions are front-panel accessible.

The D-700 integrates with station automation and features advanced integration with the Wheatstone ATC-1 AES router. Input channels may be mapped as the router's designation, allowing the ATC-1 to select sources automatically.

The D-700 incorporates Wheatstone's V-DIP Software System. The connectivity of the system allows the control surface of each input module on Wheatstone's digital consoles to be automated.

The V-DIP software also allows users to configure a Wheatstone digital console from a laptop. It also eliminates the need for setting dipswitches manually during console configuration.

The D-700 includes modularity, electronic switching, digital and analog inputs and outputs, four stereo outputs, hot-swappable modules, dual metering, auto mix-minus, eight-character alpha displays on each channel and high-resolution bit rate converters.

For information contact Wheatstone at (252) 638-7000, fax (252) 637-1285 or visit the Web site at www.wheatstone.com

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— B. M. Cox
Buyer's Guide Editor

Yellowtec Mixes Intelligently

Yellowtec, a division of Thum+Mahr, offers the Intellimix.

It is a desktop mixing device for broadcast and studio applications. The small digital mixer/router acts as a smart interface between digital or analog audio signals and PC-based audio workstations. It can operate as a console or studio mixer.

Fourteen audio sources may be connected in various analog and digital formats. There are two balanced XLR mic inputs with preamplifiers, insert points and phantom power. The mic inputs are placed on the front of the base unit.

The stereo line inputs include five AES/EBU inputs, one digital S/PDIF (switchable to TOS-Link), five balanced analog inputs with XLR connectors and one unbalanced analog input on RCA connector of consumer equipment.

The Intellimix is user configurable — input sources can be labeled, and monitoring preferences can be defined. It features two different assignable mix-minus outputs. The unit uses the Yellowtec Smartcard, which saves individual setups so multiple users can return the unit to their personal configurations.

Operation and configuration are manipulated through Windows-based software.

For more information contact Yellowtec in Germany at +49 2173-967-30, fax +49 2173-967-400 or visit the Web site at www.yellowtec.com

Studio Technology Builds Custom

Studio Technology makes furniture designed for broadcasters.

The company provides custom configurations designed to be price-competitive with modular systems and offers alternative materials such as solid surface or Granicoat.

From its 7,000-square-foot custom cabinet shop, the Pennsylvania-based company has participated in consolidation projects on both coasts and in Hawaii.

Studio Technology will work with a systems integrator or local staff and provides delivery and installation of its furniture.

For more information contact Studio Technology in Pennsylvania at (610) 640-1229, fax (610) 296-3402 or visit the Web site at www.studiotechnology.com

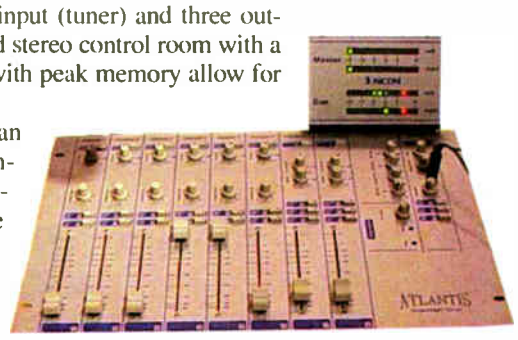
Nicom Lets Users Discover Atlantis

The **Nicom** Atlantis eight-channel mixer is designed for radio and TV broadcast audio mixing.

The mixer features modular internal construction, three balanced mic inputs, six balanced stereo line inputs, three unbalanced stereo line inputs and two telephone inputs with conferencing capability.

The master features five outputs: two balanced stereo outputs, two unbalanced stereo outputs, one unbalanced mono output and a specifically designed talk-over section.

The monitor offers one external input (tuner) and three outputs: stereo monitor, headphones and stereo control room with a talkback feature. Two LED meters with peak memory allow for constant signal control.



The two telephone channels can control the incoming call and on-/off-hook indicators. Amplifier cut-off and on-air lamp indicator are optional. The external switching power supply gives voltages between 90 and 260 VAC.

For more information contact Nicom in California at (619) 477-6298, fax (619) 477-6296 or visit the Web site at www.NicomUSA.com

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AMPLIFIERS

Want to Sell

ASUSA A-2 stereo tube amplifier, 7 tubes, full wave rectifier tube, like new, for home stereo, can use w/or w/o pre-amp, w/manual, black w/open top design, $385/BO. Jeff Thornton, Maple Island Comm, 18617 State Hwy 104, Glenwood MN 56334. 320-634-3213.

ANTENNAS/ TOWERS/CABLES

Want to Sell

6-Bay CP, rated 1 kW, on 95I7 MHz, $500. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-437-6549.

Jampro JSCP-2R 2-bay w/raydomes w/phasing harneww & side mount hardware, 1-5/8" coax fittings, tuned to 101.7 MHz, $950; Dielectric/RCA BFC 1-bay w/heater, brand new, tuned to 107.9 MHz, stainless steel, $500. David Neuchterlein, WELQ TV19, 6130 S Dehmel Rd, Frankenmuth MI 48734. 517-686-9341.

Rohn SSV Series 100' self supporting tower N-1 through N-5, on ground, $5500. Ms Sharp, Saturn Comm, 11419 SE Prairie Rd, Galena KS 66739. 316-856-3794.

Scala 5 element Yagi, one ctr mount & one rear mount, both 106.5, $150 ea. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

Dielectric 3-1/8" motorized four port coaxial switch; Dielectric 3-5/8" motorized four port coaxial switch . Continental Communications, 800-664-4497. Email: contcomm@fiastl.net.

ERI SHP-10AC used 10-bay high power rototiller, gd cond, 102.5-MHz. Chris, 816-628-5959.

Want to Buy

Two radomes (radomes only) for a Shively 6800 series antenna, reasonable cond. Tom Eirman, KAJX, 110 East Hallam, Aspen CO 81611. 970-925-6445.

AUDIO PRODUCTION

Want to Sell

Otari MX 5050 pro r-r deck, may need minor repairs, selling as-is, $110 +shpg. Dave Sheehan, Mr. Video, 1601 2nd Ave N., #403, Great Falls MT 59401. 406-761-6346.

Yamaha GC2020B II stereo compressors (2), $100 ea. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

ANTEX AUDIO CARDS, will not be undersold. A.S.C. (619) 523-1575.

Urei 565 Little Dipper EQ, $700; ADC Propatch 1/4" punchblock patchbays, new, $600 (many); 1.4" TRS patch cords like new, $15; ADC TT 144 point patch bays, recond, $149-229. W Gunn, 760-320-0728.

Want to Buy

360 Systems Instant Replay, used. Rocky, 727-579-8700.

Gates Sta-Level. Looking for one or better yet, a pair of these limiting amplifiers. Mark Schackow, Mark Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

Yamaha BP-2 bass pedal unit, prefer electronics, but will be happy w/schematic & literature. B Meuse, Muse Audio Arts, 191 E El Camino Real #209, Mtn View CA 94040. 650-969-2433.

AUTOMATION EQUIPMENT

Want to Sell

Arrakis DL4 music on hard drive music system loaded w/country, room for 2000 songs, includes software for DL3 to control DL4 & a 3 chnl LCD front panel. Plus a DL3-600 system w/2 hard drives that will hold 14 hrs of audio, all in great working cond, complete automation system, $6000. David Widener, 222 Commerce St, Kingsport TN 37660. 423-246-9578, 540-783-3151 or davidw@wtfm.com.

Want to Buy

Arrakis DL-3 digital audio workstation. Wilmer Borneman, WBYN, 280 Mill St, Boyertown PA 19512. 610-369-7777.

CART MACHINES

Want to Sell

BE triple deck, gd cond, record made need work, 200 free carts, $1000/BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

ITC Delta 3 deck stereo PB, $350. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-437-6549.

Gates/Harris stereo R/P (2) w/remote cables, BO; Various ITC, BE, Beaucart, most stereo, BO. J Lalino, WLAL, 319 Rt 29, Middleville NY 13406. 315-891-3110.

CD-R DUPLICATORS

Want to Sell

COMPLETE FACILITIES

CONSOLES

Want to Sell

Harris Executive, 10 chnl stereo, $950. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-437-6549.

Peavey MD12 12 chnl mixer, $100. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

Tascam MS-16 w/autolocator, 16 chnls DBX & custom rollaround formica cabinet, very low hrs, $2959 +frt; Audioarts Wheatstone MX-8 audio mixer, upgraded to 16 chnls, $2495 +frt. Stan Warren, Real to Reel to Reel Recording, 970 East Lake Drive, Bartow FL 33830. 863-533-4650.

Yamaha MC1602, 16 chnl stereo, aux lines gd, main out distorted, looks gd, $300; EV EVT 5212 12 chnl stereo, like new, $400. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

Auditronics 210 24 mixer broadcast console. Continental Communications. 800-664-4497. Email: contcomm@fiastl.net.

Soundcraft 600, 24x8, $3900; JL Cooper 16 trk automation, $1200. W Gunn, 760-320-0728.

DISCO-PRO SOUND EQUIP

Want to Sell

EMU Proteus Pro/cussion drum module w/pads, $300. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

LIMITERS/ AUDIO PROCESSING

Want to Sell

CBS 444 Volumax-Audimax combo (2pr) w/manuals, $200/pr. Herman Gibbs, WKVX/WQKT, 186 S Hillcrest, Wooster OH 44691. 330-263-2212.

Orban Optimod 8000, $800; CRL Amigo AM stereo audio processor, $1800. David Hood, WTLC, 40 Monument Circle #500, Indianapolis IN 46234. 317-684-8128.

CBS Volumax, $400/ea; mint Urei 1176LNs, black, $2300; 1176LN silver, $1800; 1176 original blue/silver transformer I/o, $2300. W Gunn, 760-320-0728.

Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

Want to Sell

EV 635L mics, $95; Altec salt shaker mics, $295/ea. W Gunn, 760-320-0728.

Want to Buy

RCA 77DX & 44BX, will pay $500 to $1000. Larry Drago, WELI, POB 85, Hamden CT 06514. 203-230-5255.

RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted, top dollar paid! 615-352-3456, FAX: 615-352-1922.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

RCA ribbon mics. W Gunn, 760-320-0728.

MISCELLANEOUS

Want to Sell

Ronk RotoCon Mark II phase converter, single phase to three phase, 40 KVA, new, $2500/BO. Carl Haynes, WRTM, POB 9734, Jackson MS 39286. 601-981-9080.

Sherwood Elec Lab S3MX, FM stereo multiplex, MX adapter tube units; FAA FA-5682 power suppoy, $20; Voltampere Corp DC power supply, -0-40V 0-50A pp7545-B10 90 lbs. Will Dougherty, WLD Recording, Route 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

MISCELLANEOUS (cont.)

Want to Buy

Conax, Triad A9J, A10J, A11J, A12J, Stancor PSO/PCO 150, PCC 200. Richard Robinson, Trod Nossel Recording, POB 1425, Wallingford CT 06492. 203-949-0871.

On-Air signs from 50's & 60's, paying $200 for ea sign in any condition. Larry Drago, WELI, POB 85, Hamden CT 06514. 203-230-5255.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NYNY 10003. 212-674-3060.

MONITORS

Want to Sell

JBL 4411 studio monitors (1 pr), $300; Urei 809A studio monitors (1 pr), $500. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032.

TFT 753 & 755 AM mod monitor w/preselector, $1000; Delta ASM-1 AM stereo mod monitor, $3000. David Hood, WTLC, 40 Monument Circle #500, Indianapolis IN 46234. 317-684-8128.

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

Yamaha NS10Ms, $295. W Gunn, 760-320-0728.

RECEIVERS/ TRANSCEIVERS

Want to Sell

Zephyrs, four cards, excel cond, BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

RECORDERS

Want to Sell

Ampex AG-440C (2), gd cond, one needs brake adjustment, $1000/BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

ITC 750/770 r-r tape decks (6), play only, $50 ea; (2) ITC 750/770 r-r tape decks R/P, $100 ea; ITC 850 r-r tape deck, R/P, $300. Dennis Whitehead, WCTS, 900 Forestview Ln N, Plymouth MN 55441, 612-417-8270.

Sony DTC1000 DAT machines (3) w/Radio Systems conversions, $250 ea; Teac c-3RX cassette deck, $50; Akai DR4d digital recorder w/1-gig external HD, $300. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

Dictaphone 5000 Veritrac recorder, comm. Recording system w/service manual & reels, excel cond, BO. Paul Sidney, WLNG, POB 2000, Sag Harbor NY 11963. 631-725-2300.

Scully 280, $150; (2) Tanberg 150-21 Series 15, $100/pr; Viking TD-235, 7.5 & 15 ips, $15; Wollensak 3M 5000 reel, 1-7/8, 3-3/4, 7-1/2 ips, $40. Will Dougherty, WLD Recording, Route 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

New MCI 110C-2s, $1800; Scully 8 trk, $1500; new short MRL test tapes, $229 for 2", $79 for 1/4", all formats avail; Otari MX5050 Mk III-8, $3k; Otari CB110 remote, $300; CB116 locator, $550 (all for $3.5k); Tascam 85-16 w/locator, remote, dbx, $1800; MCI JH110B 8 trk w/locator, $2900; Akai ADAM new, digital 12 trk, $3500; Ampex ATR102 rebuilt 1/4", $4900, 1/2", $6400; Technics RS1500 isoloop recorders, $695; Otari 5050 2 trk, $695. W Gunn, 760-320-0728.

Want to Buy

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

REMOTE & MICROWAVE

Want to Sell

Marti RMC-15 16 chnl remote control, $250. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-437-6549.

Remote van, 1989 Ford w/30' hydraulic mast, in gd cond, located in Orlando, $6000. George Arroyo, WONQ, Orlando FL. 407-830-0800.

Vodav I Starplus, 1428 digital telephone system, configured to 8 line ports & 16 station ports, maximum expansion: 14x28, has 2 digital liquid crystal display speaker telephones & 9 digital enhanced speaker telephones, used less than 1 yr, $2500; ITT 801 telepone system, older but works, $200. Ms Sharp, Saturn Comm, 11419 SE Prairie Rd, Galena KS 66739. 316-856-3794.

Burke TC-8 remote control, need studio & xmtr units, must be in excel, reliable cond, must include manuals also. Call with price. Joe Cutroni, WCUW, 910 Main St, Worcester MA 01610. 508-753-1012.

Gentner 2000 remote control or Gentner 1000, which is upgradeable. Jim Parman, WHIR/WRNZ/WHBN, 2063 Shakertown Rd, Danville KY 40422. 859-236-2711.

SATELLITE EQUIPMENT

Want to Sell

Wegener DR96-QN sat rcvr, like new, $1200/BO. Carl Haynes, WRTM, POB 9734, Jackson MS 39286. 601-981-9080.

SOFTWARE/ DATABASES

Want to Sell

BUILD A COMPUTER TOOLBOX AT www.epix.net/~ronnieb

STATIONS

Want to Buy

AM or FM located in RI, MA or CT area. Non commercial or commercial, no station to small, will consider partnership. Michael Cardillo, 151 Morgan St, Cranston RI 02920. 401-942-8341.

TAPES/CARTS/ REELS/CD's

Want to Sell

Various carts $.50 ea; reels 10.5" empty, $1 ea, full $3 ea. J Lalino, WLAL, 319 Rt 29, Middleville NY 13406. 315-891-3110.

Want to Buy

10.5" music reels, Drake Chenault, Radio Arts, contemporary, basic library reels, '70s or '80s. Chuck, 570-434-2609.

10.5 music reels: Drake Chenault radio mts, contemporary/basic library reels, 70's or 80's. Chuck, 570-434-2609.

TAX DEDUCTIBLE EQUIPMENT

100W low power xmtr & studio equipment wanted for non comm. Christian radio. Serge Petit-Homme, Lakay Bdctg, POB 9412, Bridgeport CT 06601. 914-966-3436. csb1118@usa.net.

TEST EQUIPMENT

Want to Sell

B&W Nidek 400 distortion meter, $45; Beta Scope 8519 non destructive thickness gauge; Eico 1078 voltage & amp meter, $35; Eico 1120 capacitor substitution box, $20; Electronics 36-616 CRT tester & rejuvenator, FC/B&W manual, $20; Heathkit T-3 visual-aural signal tracer, $37. Will Dougherty, WLD Recording, Route 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

CONSULTANTS

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

TRANSMITTERS

Want to Sell

1976 CSI FM 3000E single phase xmtr upgraded to 5000 kW in 1993, w/manual, $5500. Ms Sharp, Saturn Comm, 11419 SE Prairie Rd, Galena KS 66739. 316-856-3794.

Continental 831-D-2, 2.5 KW FM w/exciter, excel cond, $5000/BO. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-437-6549.

Gates 1 kW FM xmtr, BO; QEI 695T 3.5 kW solid state w/one tube final FM xmtr, BO. Max Latham, KMRL, POB 1307, Buras LA 70041. 504-657-7003.

Gates BC1-H 1000W AM xmtr, very gd cond, must pick up, $4500. David Hood, WTLC, 40 Monument Circle #500, Indianapolis IN 46234. 317-684-8128.

Harris TE-3, great spare, on 100.1, crystals still avail, $550. Kinnon Thomas, The Thomas Sound Group, 619 S Main St, Gainesville FL 32601. 352-376-8742.

RCA BTA5R in gd cond, no PCB's, great back up or for parts, was in working cond when removed from service, includes spare parts, $2000/BO +U-pick up. Doug Hawkes, WKAM, 930 E Lincoln Ave, Goshen IN 46528. 219-533-1460.

RCA BTA-5U 5 kW AM, excel cond on 810 kHz, BO. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-437-6549.

Tepco J-340, 2 yrs old, like new, 3 avail, $2000 ea. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

1992 Energy-Onix Legend 1000, 1000W solid state xmtr, less exciter, tuned to 91.1 FM, vg cond, high school station, used only 50% of time, $5000. John Wilsbach, WMSS, 214 Race St, Middletown PA 17057. 717-948-9136.

Harris/Gates BC-1H1 xmtr on 900 kHz, still operational. Hear it on the air, in very gd cond, some spares, $3500. Frank Folsom, WKXV, 5106 Middlebrook Pike, Knoxville TN 37921. 865-573-6171.

Nautel Ampfet ND1, 4 yrs old, 1 kW AM in perfect cond, tuned to 1570 kHz, avail now, $8000/BO. Richard Miller, KUAU, 590 Ulumalu Rd, Haiku, Maui HI 96708. 808-572-5534.

Ramsey FM-100 1W stereo FM, any freq, $375; Ramsey FM-25 1W stereo FM, any freq. G Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

BEXT TRANSMITTERS – Call for demos, closeouts, full warranty. 619-239-8462.

CCA 25,000W, '70s vintage, OK shape, $8900; **QEI 3500W FMQ-3500** w/matching exciter, currently on air, excel cond, $10,900. Chris, 816-628-5959.

Continental 831-D2 2.5KW FM xmtr. Continental Communications. 800-664-4497. Email: contcomm@fiastl.net.

McMartin BF-10K 10 kW FM, factory rebuilt, in perfect, like new cond, includes new tubes, tested & tuned on your freq. Guaranteed. Adjustable from 5.5 kW to 15 kW, FCC type accepted. Goodrich Ent, 402-493-1886.

McMartin BF-5K 5 kW FM, factory rebuilt in perfect, like new cond, includes new tubes, tested & tuned on your freq, guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Ent, 402-493-1886.

Want to Buy

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

TUBES

Want to Sell

Transmitter power tubes, 892R & 5671, $300 ea. Milton Jones, WHJM, POB 10713, Knoxville TN 37939. 865-573-8670.

AMPEREX, EIMAC, SVETLANA 3CX400A7/8877, 3CX3000A7, 3-500ZG, 4CX250B, 4-400, 4CX400A, 807, 833C, ETC. Westgate 800-213-4563.

TUBES, Eimac, Svetlana, RF parts, **800-430-6683, Fax: 905-844-6263** www.hard-to-find.net ams@hard-to-find.net

TURNTABLES

Want to Sell

Garrard AX-20 record changer TA-MK II w/Harmon-Kardon manual, $25. Will Dougherty, WLD Recording, Route 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Russco Studio-Pro (2) w/Shure tonearms & amps, $300 for both. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

EMPLOYMENT

HELP WANTED

CHIEF ENGINEER: Radio Station WOR seeks a Chief Engineer. Candidate will have a minimum 5 years in radio, be computer literate & experience with high power AM Transmitters, Directional Antennas, Digital Audio Systems, Novell, Windows NT & Windows 98, Digital & Analog Telephone Systems, Studio and Facility wiring. Duties include repair and maintenance of WOR's transmitter plant and Studio Complex. Requires on-call status and all-hours transportation available to reach the transmitter site in Lyndhurst, NJ. Resume & cover letter to personnel@wor710.com or WOR Radio, 1440 Broadway, NYNY 10018. Attn: Personnel – **NO PHONE CALLS.** F/M EOE

ENGINEER POSITION OPEN
Saga Communications' new acquisition in Northampton MA seeks experienced engineer. Please send information about yourself and your mix of RF/AF/IS skills for consideration to: Greg Urbiel, DOE, Saga Comm., Inc, 73 Kercheval Ave #201, Grosse Pointe Farms MI 48236. gurbiel@sagacommunications.com.

Immediate opening for Chief Engineer for 5 stations in Gainesville/Ocala, Florida. Must be experienced in high power transmitting equipment, microwave, network computer systems, satellite, installation and maintenance of digital automation equipment. Stable company, competitive salary and good benefits. Fax cover letter and resume to: Jim Robertson, 352-622-7822. EOE M/F.

STAFF NEW WBNN-FM 105.3 CENTRAL VIRGINIA. On air September. Manager, announcer, sales person, sec. Computer operator. POB 889, Blacksburg VA 24063. Fax resume 540-951-5282. EOE.

NEW WESTERN NEW YORK radio station seeking morning & afternoon drive sports talk hosts. Individual should have 5 years experience, have in-depth knowledge of Buffalo based sports teams, posses journalistic instincts, & be an entertainer. Trash talkers need not apply. Tapes & resumes should be sent to: John Demerle, 795 Indian Church Rd, West Seneca NY 14224. NO PHONE CALLS PLEASE.

HALF TIME C.E. for KTRU-FM. Good salary + BENEFITS. See http://dacnet.rice.edu/~humres/Employment/ or willr@rice.edu.

POSITIONS WANTED

Broadcasting graduate, voice extrordinaire, looking for voice-over & character-voice work, creative writer, energetic, hard worker. Sandra 918-664-9794.

Creative graduate of American Bdctg School, looking to boost your ratings as an on-air talent. Outgoing male ready to work, call Jeff at 817-784-9418/972-573-0609.

I'm new to the biz, but not new to a working environment & responsibility. Willing to take on any job. Altoidman1@home.com or hear me live at www.radioschool.com.

New talent in the Radio industry. I'm ready to have fun & learn, so if you're ready call Justin @ 248-348-1513.

Radio, TV, Advertising, my priority is your station. Local talent of OKC with a voice of excellence, travel possible. Leslie, 405-390-9754.

Seasoned broadcast engineer ready for more. Drug & alcohol free, DWM 36, all personal & professional noble qualities, real, technologically progressive & ratings-motivated team player. SeasonedEngineer@aol.com

Young, aspiring on-air personality seeking FT employment with medium to major market station. Let me put my desire for excellence to work for you. Al, 405-214-5856 or 405-273-0395.

6 yrs experienced & certified young broadcast DJ & production assist/mgr. Worked for 3 different hit music FM stations around the world. Designs St.ids & promos on PC using own voice. MP3 demo on demand. Can travel. Contact djazhar@usa.com.

CE/Computer Tech w/20+ yrs, hands on engineering exper seeks CE position in a top 100 market. Strong audio, computer networking & RF skills. 704-563-8676.

Experienced CE seeks FT, PT, contract, seasonal work. NE friendly, outgoing CE seeks work in the northeast. Radio, Am, FM, TV work, FCC licensed, CET, amateur radio operator. Experienced in carrier current AM & MDS also. Mitchell Rakoff, 81-12 Roosevelt Ave #702, Jackson Heights NY 11372. 718-969-5224. radiomitch@webtv.net.

Morning AT/PD, Wyatt Earp attitude radio! Ratings, phones, women 18-54. Country, oldies, A/C only. Email for more info at roadieking@yahoo.com.

SERVICES

ADVERTISER INDEX

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12	Armstrong Transmitters	www.armstrongtx.com
21	Arrakis	www.arrakis-systems.com
45	Arrakis	www.arrakis-systems.com
52	Arrakis	www.arrakis-systems.com
54	ATI	www.atiguys.com
17	Audioactive, a Telos Company	www.audioactive.com
38	Audion Labs	www.voxpro.net
43	AudioScience	www.audioscience.com
37	AudioSonix	www.audiosonix.com
2	Auditronics/Wheatstone	sales@wheatstone.com
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3	Broadcast Electronics	www.bdcast.com
59	Broadcast Richmond	www.broadcast-richmond.com
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50	BSW	www.bswusa.com
32, 33	BSW	www.bswusa.com
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7	Comrex	www.comrex.com
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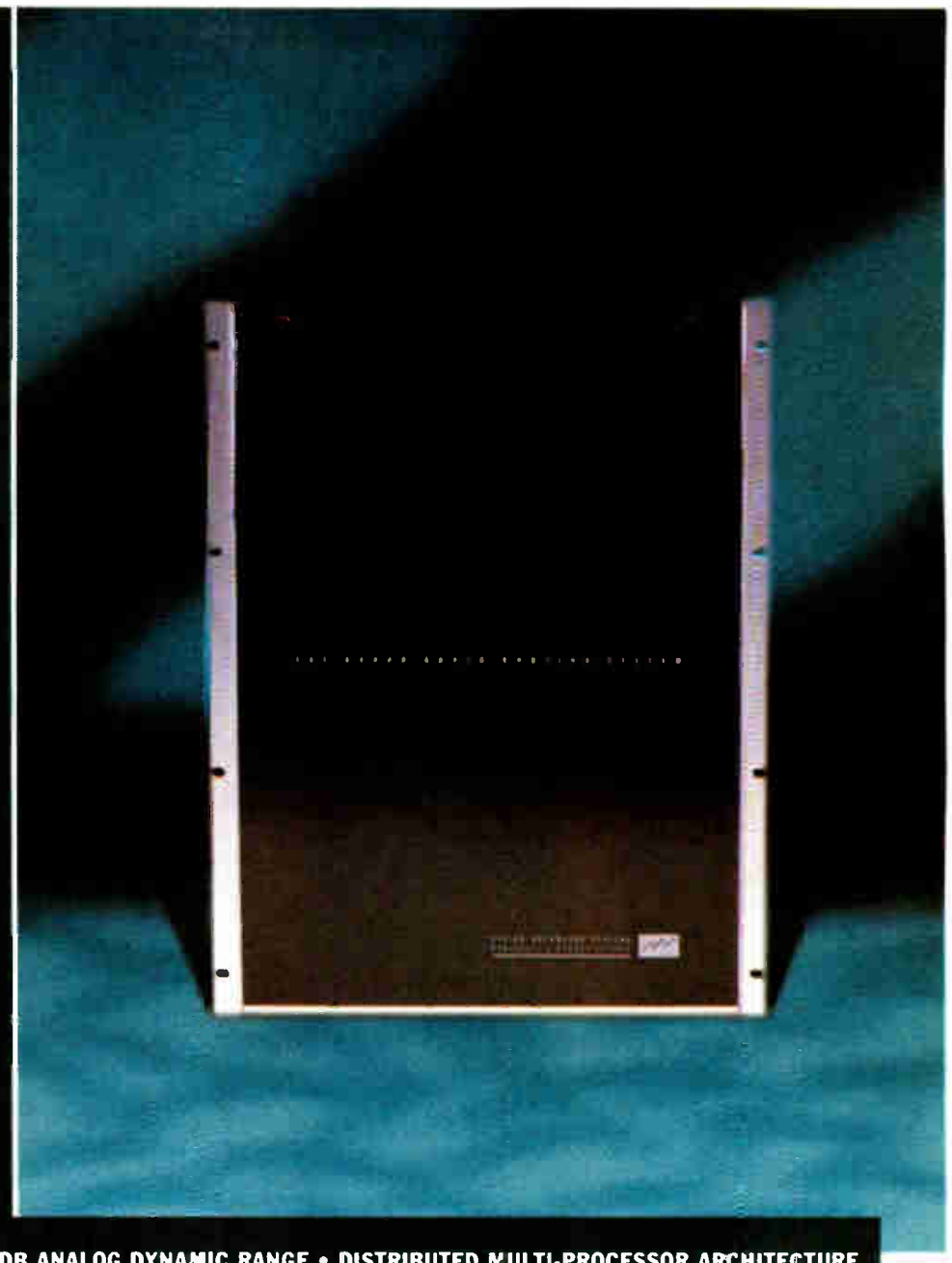
40	Cortana	cortana@cyberport.com
34	Crown Broadcast	www.crownbroadcast.com
42	Dayton Industrial	www.daytonindustrial.com
10	Digigram	www.digigram.com
42	Econco	www.econco.com
23	Enco Systems	www.enco.com
42	Excalibur Electronics	Not Available
40	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com
40	Halland Broadcast Services	www.h-b-s.com
40	Henry Engineering	www.henryeng.com
20	Inovonics	www.inovon.com
41	Inovonics	www.inovon.com
54	J Squared Technical Service	jsquared@cdsnet.net
11	Klotz Digital	www.klotzdigital.com
46	Logitek	www.logitekaudio.com
51	LPB	www.lpbinc.com
15	Lucent Technologies	www.lucent.com/ldr
42	Mager Systems	NOT AVAILABLE
27	MediaTouch	www.mediatouch.net
49	Modulation Sciences	www.modsci.com
24	Netia	www.netia.net
19	Neutrik USA	www.neutrikusa.com
54	Nott Ltd.	www.tjantenna.com
14	NSN Net	www.nsn.net
13	Omnia, a Telos Company	www.omniaaudio.com
31	Radio Frequency System (RFS)	info@rfsbroadcast.com
5	Radio Systems	www.radiosystems.com
29	Radio Systems	www.radiosystems.com
6	Richardson Electronics	www.radiotvnet.com
54	S.C.M.S., Inc.	www.scmsinc.com
16	Scott Studios	www.scottstudios.com
40	Shively Labs	www.shively.com
61	Sierra Automated Systems	www.sasaudio.com
42	Silicon Valley Power	www.svpa.com
22	Sine Systems	www.sinesystems.com
44	Studio Technology	www.studiotechnology.com
39	Syntrillium Software	www.cooledit.com
9	Telos Systems	www.telos-systems.com
63	Wheatstone	www.wheatstone.com
64	Wheatstone	www.wheatstone.com

SAS64000 AUDIO ROUTING SYSTEM

Elegant Analog

Instant Digital



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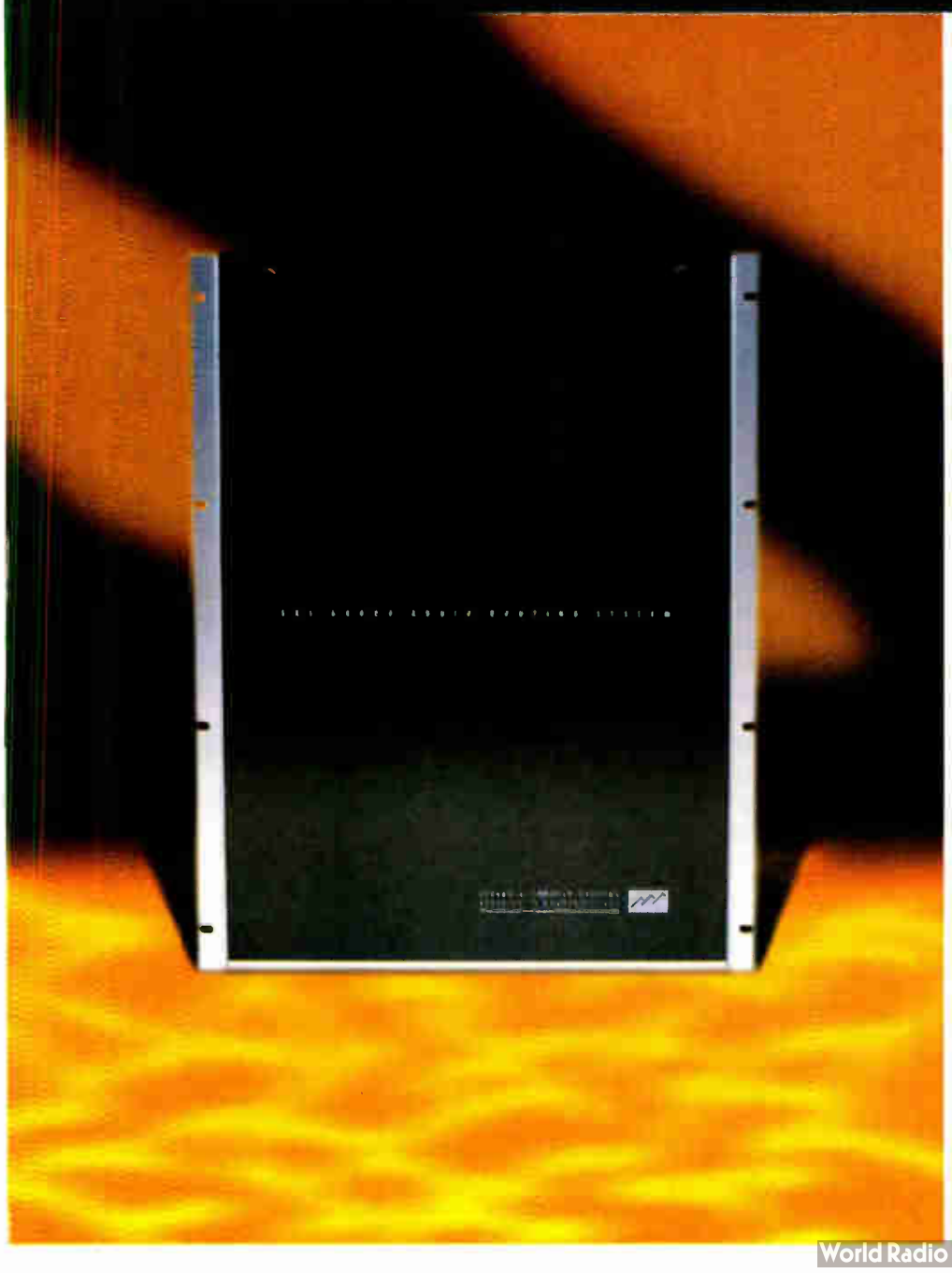

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And it's wonderfully simple, just plug in our new digital port expander and that's it. Welcome to digital! —co-existing richly with analog in the same framework.

There's lots more to tell. Call us: 818 840 6749. Fax us: 818 840 6751. E-mail us: sales@sasaudio.com Check the Web site: sasaudio.com And of course, snail mail: 2625 North San Fernando Blvd. Burbank, California 91504 USA

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SIERRA AUTOMATED SYSTEMS

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◆READER'S FORUM◆

Radio people

Dear **RW**,

In response to Mike Seaver's letter to the editor (**RW**, June 21), Garry Moore put it best many years ago when he said, "The best television is people." You can change that to "radio" and it's just as correct. The best broadcasting is, and has always been, people.

It's great that I can call our local public radio station and the announcer on duty answers the phone. If not the announcer, then someone who can relay the message that minute. I think it's neat that some stations locally can mention, quite offhand, something about the day's weather, or what they did yesterday ... and not always using the exact same voice all the time.

If the best radio is people, then the worst radio has to be machines.

Tom Carten
General Manager
WRKC(FM)
Wilkes-Barre, Pa.

Compliance and complaints

Dear **RW**,

Concerning Alan R. Peterson's article on Part 15 AM (**RW**, June 21, "LPB Transmitter: AM for LPFMers"), hold on a moment!

I keep reading about how users can get around grounding of FCC Part 15 transmitters by locating them atop steel poles, towers or steel buildings since the law limits only the length of the antenna and "ground lead." The writers seem to believe that the metal structure the transmitter is mounted on does not count as "ground lead."

Any engineer worth his salt knows that, in effect, the structure acts as an antenna/ground boosting the RF field. Well, so does the FCC. I have asked several field inspectors about the legality of such a hookup and have yet to hear one say it was not a violation.

Following is a letter I sent to the FCC along with their response.

Dear Sir,

Recently, the broadcast trade magazines have displayed advertisements for "Part 15" low-power AM stations.

These ads claim a two- or three-mile range using 100-mW transmitters. In reviewing Part 15, it appears that unlicensed operation in the AM band is possible if the maximum power input to the final stage of the transmitter does not exceed 100 mW and the antenna and ground wire do not exceed about nine meters in total length (assuming no interference to licensed stations).

In talking with the companies placing the ads, each has told me that the secret to obtaining two- to three-mile range is to locate the 100-mW transmitter atop a metal pole or high building and ground the transmitter directly to the pole or building.

If the ground wire from the transmitter to the pole or building is short and the combined length of the antenna and ground wire does not exceed nine meters, they claim this to be legal.

Their contention is that the law defines "ground wire" and does not define what that wire is grounded to.

As you know, in reality, the steel pole becomes part of the ground system and although not part of the Part 15 definition of "ground wire," it does act as an antenna causing the signal to be stronger than if the transmitter were attached to a ground rod at ground level.

Many of the ads have claimed their transmitters are "FCC-approved" and some ads have gone so far as to name field inspectors who have "inspected and approved" these stations.

Recently, I had a chance to pose a question to an FCC field inspector about his policy when he visits such stations and was told he orders them shut down.

So what is the policy toward these stations? I am one of the old-timers who holds a lifetime general-class commercial license (we used to be classified as First-Class holders) and understand that the construction of these stations as I described seems to take advantage of a less-specific definition of "ground."

It appears that whether these stations are allowed to operate or not rests more on policy than adherence to Part 15 rules relative to ground-lead length because, by strict definition, these stations are complying with Part 15.

Robert Ladd
Owner
WNRR(FM)
Bellevue, Ohio

Mr. Ladd,

Your inquiry was referred to me for reply. Before responding, I ran your question by our lab people who are responsible for issuing the required grant of certification on the AM transmitters before they can be marketed or used.

Under Section 15.219 of our rules, the maximum power is limited to 100 mW input to the final RF stage and the total length of the antenna plus the connecting lead plus the ground lead may not exceed three meters.

The antenna is part of the package that is certified. If a loading coil is used in the antenna design, we count the electrical length of the coil toward the three meters. In other words, this rule is designed to keep the practical transmission range no greater than about 250 feet.

If the installer/user places the transmitter atop a metal pole or other conducting structure and grounds the transmitter to that structure, the height of that structure also is counted toward the three meters maximum length.

You did not mention the FCC ID number on the transmitter, so I am not able to identify the responsible party. If you can supply that number to us, I would be happy to provide it to our laboratory staff. If no FCC ID number exists, the equipment may not be legally imported, sold or used.

Let me know if you need additional information on this issue.

John A. Reed
Senior Engineer
Technical Rules Branch
FCC Office of Engineering and Technology
Washington

DAB: Radio Gets iBiquitous

We laud the decision of USA Digital Radio and Lucent Digital Radio to combine efforts in developing a single system for in-band, on-channel digital audio broadcasting. Radio must go digital to compete with satellite-delivered DAB, the Internet and various mobile and portable technologies.

The companies developing satellite digital radio are moving aggressively. The recent launch of Sirius Satellite's first orbiting platform should be a wake-up call for those who wonder whether terrestrial radio needs a digital system.

Executives of the planned IBOC entity, named iBiquity Digital Corp., still hope to see a single standard completed by the end of this year, which would mean product available for sale approximately six to nine months later. That's aggressive, but according to iBiquity and equipment manufacturers, it can be done.

Some observers believe that if IBOC doesn't grab consumers' attention before satellite-DAB, it won't at all. The proponents, of course, disagree. But let's give terrestrial radio a fighting digital chance.

Industry reaction to the pending merger has been overwhelmingly positive. Mergers are never easy, said one equipment manufacturer, but: "Everybody knew this is what needed to happen."

The leaders of both companies should be congratulated for overcoming competitive concerns.

Industry observers, including **RW**, have been calling for an alliance of some kind for more than a year. Many believe the initial split-up between USADR and LDR was part of a necessary evolutionary development process: advancement through competition.

Now, each company can contribute the best of their systems to a combined system, without fractiousness over future licensing deals.

Another interpretation is that the proponents, faced with continued competition interfering with IBOC profits and future data-related projects, sobered up and did what was expedient. As the movie character might say, "Show me the cash flow." This gets the cash flow closer.

Together, the proponents can deliver one system to the standards-setting NRSC and to the FCC. Now it's time for the receiver makers and RF suppliers to get aboard a true Grand Alliance in cooperation with iBiquity, to present the regulators with a done deal, rather than another standards argument.

It's time. The satellite companies likely will have their systems up before IBOC. We anticipate market confusion as consumers are pitched both digital IBOC radio and digital satellite receivers.

A universal receiver, anyone? Now that would be ubiquitous.

Write to Us

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THE WHEATSTONE D-5000

DIGITAL AUDIO CONSOLE

This new D-5000 audio console from WHEATSTONE gives you our top-of-the-line D-600 digital technology—at a modest price!

- Totally modular design lets you hot-swap all modules for on-air servicing; even DSP and CPU functions reside on easily changed modules.
- Traditional user interface with clean layout and familiar control surfaces.
- Available with up to 26 input modules (any mix of analog and digital).
- 4 stereo mix busses, each with digital and balanced analog outputs.
- Flexible mainframe layout options.
- Inputs can be field-converted from analog to digital (and back) through a simple daughterboard change.
- Choice of 32, 44.1 or 48KHz console clock rates (can be synced externally).
- Serial port allows true integration with routers and automation systems
- Dedicated phone module with DSP generated MXM—two modules can be combined for up to 4 MXM sends.
- 3-character alphanumeric source displays above each fader.
- All channel fader, display and switch settings are addressable via the serial port for remote control and router/automation communication.
- Exclusive VDIP™ software lets you configure console with a laptop PC (no pulling modules, installing jumpers or setting dipswitches). Once configured console runs standalone.

Wheatstone Corporation

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Didn't get to NAB this year? Here's the NEW STUFF you *MISSED:*

AUDITRONICS 220

Modular, easy to install, serial control standard to work with most automation systems. Auditronics quality at a price to keep you under budget.

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D-600 technology at a modest price; serial control for most automation systems, 8 character alpha source displays, hot-swap modules.

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A whole new generation NuStar can handle up to 128 input/output signals in its rackmount engine, letting you select any source directly to each channel. Eight character alpha displays above each fader keep your operator informed and in control.

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A digital AES router with all the routing capability you need today—plus the expansion you'll definitely need tomorrow. Handles up to 256 AES inputs and routes them to 256 outputs. All switching done in the digital domain, with sample rate convertors on every digital input, plus a complete family of X-Y and input controllers for every need.

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Virtual Dipswitch Software lets you configure our consoles with a laptop computer. There's no pulling cards, setting dipswitches or installing jumpers. Once configured the consoles run standalone.

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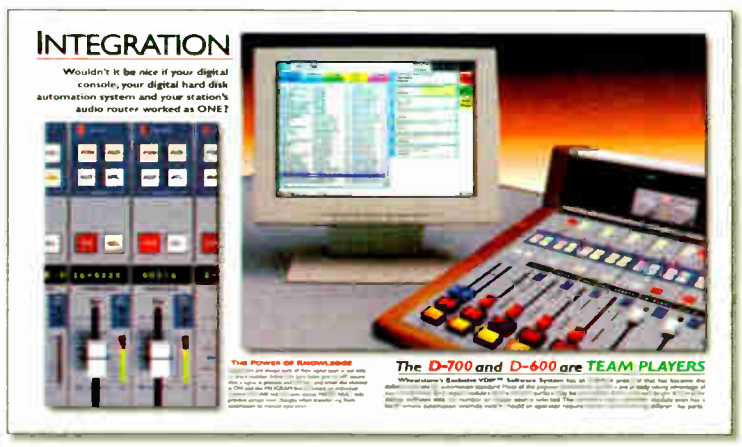
Controller can bring hundreds of shared resources to your station.



TEAM PLAYERS — Wheatstone D-600 and D-700 CONSOLES command the ATC-1 digital router; the ROUTER talks to the 8-character console channel displays. Station AUTOMATION can talk to BOTH.

WHEATSTONE'S D-700

Serial protocol is only part of the story! Each input channel can also have two stereo aux sends, four bands of EQ, compression, assignable ducking, and digital input gain control, panning and HPF—with all settings stored and recalled in up to ninety-nine security protected presets—so your talent can be up and running in just seconds. Presets can even recall bus assigns, source selection, mode, channel ON/OFF and fader settings—all through simple front panel control.

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