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EAS Patent Suit
 Quad sues Harris and Sage.

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Mics, Speakers & More
 It's NAB season, and that means new studio toys.

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Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

April 10, 2002

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NEWS ANALYSIS

EAS: Not Good Enough Since 9/11?

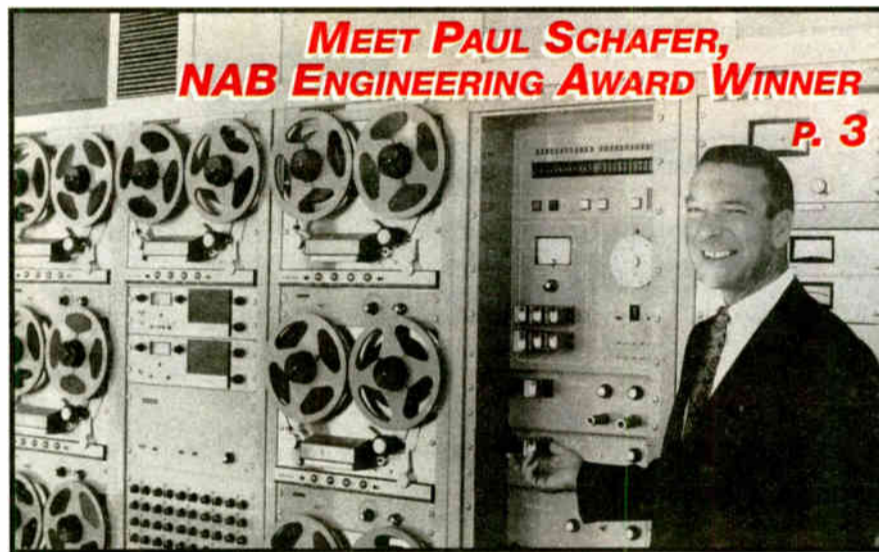
New Public-Private Partnership Aims To Upgrade Radio Disaster Warning System

by Randy J. Stine

WASHINGTON Should the Emergency Alert System have been activated in New York and Washington on Sept. 11? Should EAS be activated in case of another domestic attack?

Debate about these issues among emergency preparedness and broadcast experts has been sharp. As the issue has reached a higher level of national interest, a group has been formed to address these questions.

See DISASTER, page 6 ▶



MEET PAUL SCHAFER, NAB ENGINEERING AWARD WINNER P. 3

DIGITAL NEWS

IBOC Fees Stir Reaction

by Leslie Stimson

Many broadcasters are just realizing that to make the digital transition, they'll need to pay Ibiqity Digital Corp. software licensing fees in addition to what they will pay manufacturers for new equipment.

This comes as a shock for some executives who have been paying closer attention to day-to-day revenue and debt concerns during the economic downturn than to the likely costs of converting to digital radio.

Fee range

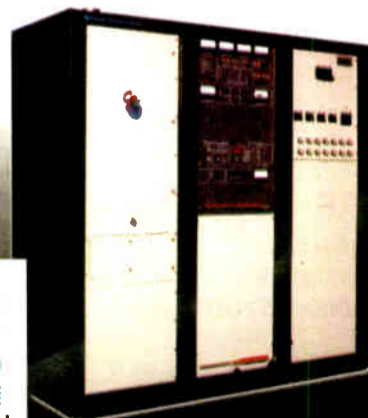
The fee issue is controversial. The median one-time licensing fee would be about \$12,900. At the top end of the scale, a Class C FM could pay about \$70,000. Ibiqity also plans to collect 3 percent of yearly station revenues from data services associated with IBOC.

In addition to the costs involved, some radio stations would end up paying fees to Ibiqity, a company owned in part by their group owners — or their competitors.

Some observers wonder if the fee question could delay, if not stop, the

See IBOC FEES, page 10 ▶

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◆ NEWSWATCH ◆

Marantz, Denon Brand Owners To Merge

Marantz Japan Inc. and Denon Electronics Ltd., along with their largest shareholders, Royal Philips Electronics and Ripplewood Holdings L.L.C., respectively, have formed a holding company to merge the operations of Marantz and Denon. Financial details were not disclosed.

The holding company is called D&M Holdings Inc. The transaction is expected to close by May.

Marantz and Denon will set up D&M Holdings with its head office in Sagami-hara City, Japan. Denon and Marantz will retain their corporate structures as separate brands and are expected to share resources such as R&D, manufacturing, engineering and purchasing. D&M will employ approximately 1,650 people.

Marantz shareholders will receive one share of D&M Holdings for each Marantz share, and Denon shareholders will receive 0.4416 shares of D&M Holdings for each Denon share. Ownership of Marantz shareholders and Denon shareholders in D&M Holdings will be 30 percent and 70 percent, respectively.

Clear Channel Begins EAS Upgrade

COVINGTON, Ky. Clear Channel Radio has begun a phased upgrade of Emergency Alert System equipment at each of its stations. The upgrade is to incorporate event and location codes, recently approved by the FCC, into EAS encoders/decoders.

One of the codes to be added is the Child Abduction Emergency Code that would activate local, regional or national Amber Plans. The Amber Plan is an early warning system to help find abducted children. The National Center for Missing and Exploited

Children is spearheading the Amber Plan.

NCMEC President/CEO Ernie Allen stated; "U.S. Department of Justice statistics show that in 74 percent of abduction homicides, the child is murdered within the first three hours. This new code will mobilize communities to respond much faster and will ultimately help save innocent lives."

Clear Channel expects to complete its EAS upgrade by the end of the year.

The FCC estimated the software upgrade cost per station at roughly \$100.

Hollings Reviews New Antitrust Process

WASHINGTON Commerce Committee Chairman Sen. Ernest Hollings, D-S.C., has begun a formal review of the Bush administration's decision to change how proposed transactions are reviewed for antitrust considerations.

Hollings believes Congress should have had the opportunity to sign off on the plan before it became final.

The Department of Justice and the Federal Trade Commission divided up industries, deciding which transactions each agency would review for antitrust considerations.

The DOJ was given jurisdiction over mass media, cable and Internet business for antitrust review (Radio World, March 27). Hollings sees this as a "substantial change" in enforcement policy, one that only Congress should determine. The DOJ and FTC say they look forward to continuing talks on the matter.

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NEWS MAKER

NAB Honors 'Father of Automation'

by Randy J. Stine

LAS VEGAS This week's NAB2002 marks the 50th consecutive annual NAB convention Paul Schafer has attended.

But this one is special for another reason: Schafer is receiving the NAB Radio Engineering Achievement Award at the Technology Luncheon.

The award, given to industry leaders for significant contributions to the advancement of broadcast engineering, recognizes Schafer for six decades of broadcast experience, including his work in the development of on-air automation systems and remote-control equipment for radio.

Company president

Schafer, 76, is president of Schafer International, a broadcast equipment distributor. The Bonita, Calif., company does most of its business in Mexico, selling audio gear to radio and television stations.

His friends in broadcasting say Schafer's influence has been felt throughout the industry thanks to his technical innovations. Others decry automation, saying it helped to spur the end of unique local radio programming and led to fewer on-air jobs and the rise of sparsely manned or unattended stations that use automated programming.

"His systems were well-built with first class parts. His concepts, now in computer form, are the foundation of many radio stations today," said Andy Laird, vice president of radio engineering for the Radio Journal Broadcast Group and a member of the NAB award nominating committee.

"To say that I'm honored to receive this award would be a masterpiece of understatement," Schafer said. "Especially for doing something that has been fun and interesting for 60 years."

The first Schafer Automation System, installed at KGEE(AM) in Bakersfield, Calif., in 1956 was dubbed the "blue-wire job" because all of the wiring in it was blue, Schafer said.

"The owner wanted to program his station all night long without a person being there. I used a couple of Seeburg record player changers to play 45s and several Ampex reel decks for commercials and we were in business," Schafer said.

Originally, commercials had to be dubbed sequentially to play back in the right order. Before long, Schafer, with the



Paul Schafer in 1948 at WANE(AM), Ft. Wayne, Ind.

back-time music to join network newscasts without having to fade the music.

Schafer said the automation system consisted of two racks: one held the "brains," another contained three tape reel-to-reel decks. The Seeburg record

See SCHAFFER, page 5 ▶

Schafer: 'A Great Audio Man'

I worked closely with Paul when the FCC tested FM stereo in the California desert in the 1960s. He prepared all of the audio for the tests and was essential in proving that FM stereo was practical and should be accepted by the world as the standard. He is a great audio man and really understood stereo. I consider him to be greatly talented and a real authority on all things audio.

— Harold Kassens
Retired FCC Deputy
Broadcast Bureau Chief

I've known Paul for over 40 years and always look forward to seeing him at the NAB shows.

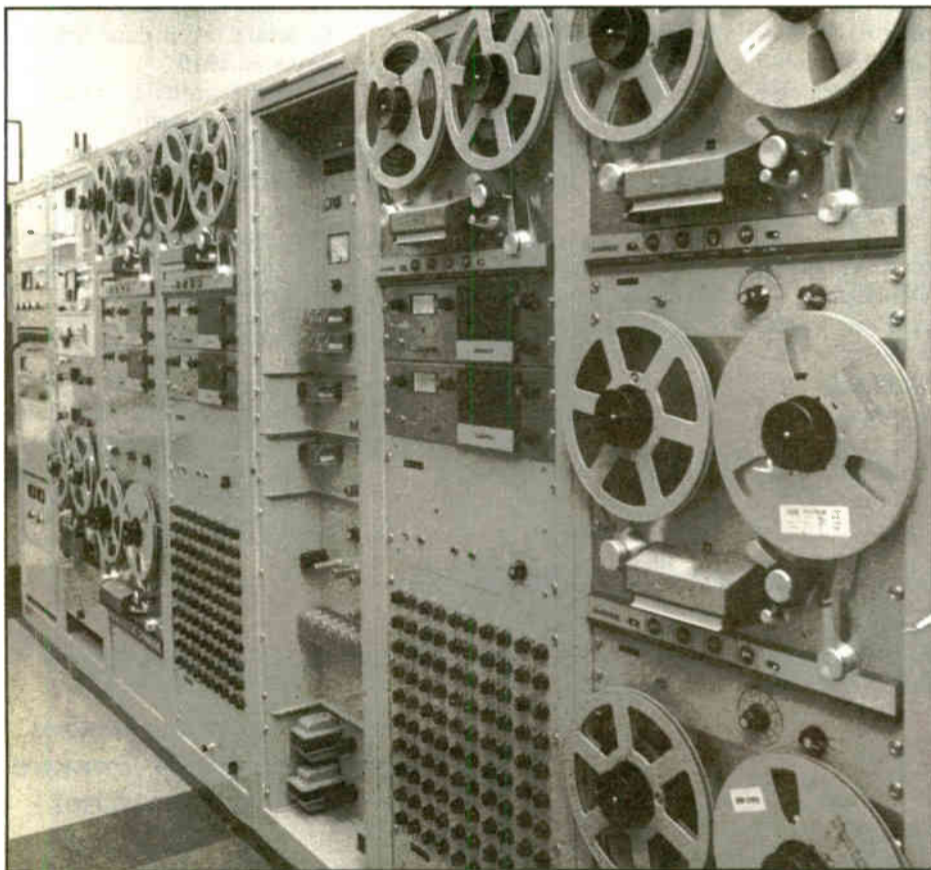
He deserves to be recognized for his automation systems and what they meant to small stations. Automation offered them an affordable means to operate their FM stations when they couldn't simulcast anymore. He also did a lot of great work with remote control equipment for transmitters.

— Mike Dorrough
President; Dorrough Electronics Inc.
and past NAB Engineering Award winner

I worked for Paul for 10 years at Schafer Electronics and thought he was a neat guy and fun to work with.

He always had great ideas and was a real innovator. He was also a super salesman. He just had a knack for seeing a need and then developing products that broadcasters wanted to buy.

— Bob Levinson
Former Director of Manufacturing
Schafer Electronics



Model 800 with tubes and spotter is shown in about 1969 at KDTH/KFMD, Dubuque, Iowa.

Schafer devised a remote-control system allowing for unattended transmitters in 1953 when the FCC relaxed the rules requiring engineers to be stationed at transmitter sites around the clock.

Next, when asked to design an automation system for a California broadcaster, he constructed a system of record players and reel-to-reel tape decks that would prove to be a forerunner to today's PC-based radio automation systems.

Most industry observers would agree that the Schafer Automation System forever changed the way radio operators run their stations.

help of Chief Engineer Jim Harford, designed a better system. The "spotter" used Ampex reel-to-reel tape decks that could fast forward and rewind to count windows cut from the tape in order to locate specific commercials.

"We removed about an inch of the oxide from the tape every minute. The 'windows' were then counted by the automation system as they passed between a lamp and a photocell to find the right commercial to play," Schafer said.

The Schafer Automation System used a series of relays and stepping switches and a clock that allowed programmers to

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FROM THE EDITOR

The IBOC Side Fires Back

by Paul J. McLane

With in-band, on-channel DAB hardware on the show floor at the NAB convention this week, and with an NRSC endorsement of the AM system possibly being issued even as you read this, the topic of IBOC is hot to the touch.

Our masked engineer Guy Wire didn't like what Skip Pizzi wrote in our March 1 issue. You can read Guy's reply online, and the subsequent exchange between Guy and Skip, at www.rwonline.com.

Also, I reported last time that a member of the pro-IBOC com-

munity had taken exception to Pizzi's column. At first the source declined to reply in print, but he subsequently accepted my offer to summarize his gripes.

"Skip says satellite will sound better than FM IBOC. Plain wrong," the source wrote.

"Satellite runs PAC at 64 kbps max, FM IBOC is 96 kbps max. There is a big difference, in FM's favor.

"Skip 'calls into question' the migration to all-digital as problematic, and hints that long tuning times will be unacceptable to young listeners. Not accurate.

The all-digital system has a low bit rate digital backup channel

that provides instant tuning.

"He states that 92 kHz subcarriers must be shut down. Not accurate. Ibiqity has successfully operated on stations with 92 kHz subcarriers and its testing has demonstrated acceptable compatibility with any subcarrier.

"He states that 'beyond the audiophile fringe' there will be no benefit to IBOC. What about mobile data? IBOC brings the same data services to AM and FM broadcasting that are being delivered by satellite. Station ID info, additional commercial services, song and artist titles and an additional 50 kbps of data for services we can't even imagine yet.

"An entire industry is developing to bring these new services to listeners and new revenue streams to broadcasters, and market research clearly shows they are valuable to the masses," the IBOC supporter continued.

"The premise of Skip's article, that this is a closed standard-setting process, is just wrong. The system has been tested and evaluated by the NRSC, through an open process involving receiver, semiconductor and transmitter manufacturers, public interest groups and broadcasters. It is probably the largest coalition to ever work on a standard, and is the most thoroughly tested system in U.S. broadcasting history."

The source closes by arguing that Skip himself works for a software company whose operating system is "the most closed standard development in history, arguably the most successful standard in history."

As always, your own opinions are welcome to radioworld@imaspub.com.

★★★

Not long ago I heard from Paul Schafer, often called the father of automation. I had planned to let you know what he was up to these days.

Then came word that Schafer is the winner of NAB's Radio Engineering Achievement Award and will be honored at this month's convention. Randy Stine profiles Schafer on page 3, so I won't go into the details here.

I did, however, enjoy Paul's comment about what he's been doing in recent years.

"When I 'retired' from Schafer Electronics in 1968, when I sold it to Applied Magnetics, I formed a new company, Schafer International," he told me. "Basically I sell stuff to radio and TV stations in Mexico, which gives me the perfect excuse to park my motor home on 'my beach' in Mazatlán, Mexico, for two or three months each winter."

And how about this for a side business: He also purchases giant video screens from U.S. venues and stadiums for resale in Mexico.

Need a Sony Jumbotron or Mitsubishi Diamond Vision screen, complete with its own building? He's your man.

Hey Paul, selling stadium screens is a long way from hauling a trailer behind your car, going station to station with Seeberg play units and a sequencer.

Readers can learn more about Schafer's current business at www.schaferinternational.com.

Congratulations to Paul Schafer on his NAB award.

★★★

In recent months you've noticed a new name in our pages: Richard Fry.

I'm proud that Radio World continues to add contributors of this caliber. Fry is an FM RF system analyst and author of numerous technical papers and software concerning radio transmission technology.

A former FM systems applications engineer with Harris Corp. and field supervisor and engineer with RCA Service Co., he is now retired. Dick also has years of experience as a radio/TV station staff engineer, and co-authored the FM Transmitter section of the NAB Engineering Handbook, 9th Edition.



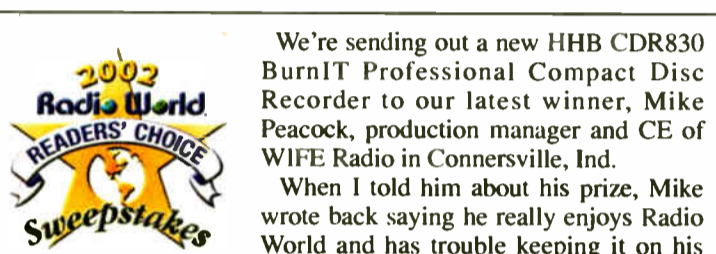
Richard Fry

He holds SBE CPBE Life Certification and a lifetime FCC 1st Class Radiotelephone/General Class license, first issued in 1959.

He has written for you already about antenna sidelobes and the cost of IBOC implementation, and he provided a great series of Q&As with prominent FM consultants. Look for more from his word processor soon. Welcome, Dick.

★★★

In our next issue, we'll tell you which products you picked as the winners of our first annual Reader's Choice Awards. Watch for it ...



We're sending out a new HHB CDR830 BurnIT Professional Compact Disc Recorder to our latest winner, Mike Peacock, production manager and CE of WIFE Radio in Connersville, Ind.

When I told him about his prize, Mike wrote back saying he really enjoys Radio World and has trouble keeping it on his desk, everyone likes it so much.

His prize records on both CD-R and CDR-W media. Its 24-bit A-D converters and 24-bit multilevel Delta Sigma D/A converters provide great sound quality. Its laser assembly delivers accurate recordings for playback on a range of CD players.

Digital input gain control enables balancing of recordings made from digital sources such as CD, DAT and MD. The unit also has digital left-right balanced control. Retail price: \$569.

Don't forget to sign up yourself to win prizes in our Readers' Choice Sweepstakes at www.rwonline.com.



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Jeff Kuhne, Engineer, WRPI-FM

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Schafer

► Continued from page 3

player changers held 100 records each.

Programming the system was limited at the beginning. The front control panel consisted of a series of diode pins to allow programmers to change a sequence or repeat it, Schafer said.

"They could set up a pattern by screwing diode pins into any of the many holes in the clock. Typically this would be each 15 or 30 minutes to play station breaks," Schafer said.

Silence trigger

In the original Schafer Automation System, the switching from one event to the next was triggered by silence.

"Whenever silence was sensed the system would step to the next event. There would be the occasional record with a pause that would give us fits, of course," Schafer said.

To remedy that problem, Schafer introduced a system using a 25 Hz tone at or near the end of an event on reel-to-reel tape. The tones, which were inaudible to listeners, allowed for overlapping of events and made the system sound better, he said.



Schafer started Schafer Electronics in his garage in 1953.

"The system used stepping switches, like the ones telephone companies used at the time. After the tone or silence, the next element was triggered, which was determined by the setting of switches on the front panel," Schafer said.

Eventually, Schafer's automation system used Viking cartridge decks and then Sono Mag Corp. carousels for commercial playback. Ultimately, broadcasters dubbed music onto reels, which improved the reliability of the automation system and meant the 45s no longer wore out, Schafer said.

"For about the first five years after we introduced automation to the radio industry, we were the only ones producing anything of the kind. We sold direct and through Gates, Collins, RCS and IGM," Schafer said.

To help spread the word of his innovation, Schafer had three motor homes traveling the country demonstrating Schafer Automation Systems to radio broadcasters. "The idea was so new, it was the only way to get the idea of automation across," he said.

In early 1959, Schafer purchased a radio station of his own to help demonstrate how efficiently a station could be run with automation. The station, KDOT(AM) in Reno, Nev., operated with a staff of three.

"The manager did the selling, the engineer was also the announcer and one

office manager ran things in fine fashion," he said.

His company sold more than 1,000 versions of its automation design, including the Schafer Model 800, probably the most reliable of them all, Schafer said. In fact, some are still in operation at radio stations in Mexico, he said.

Schafer sold Schafer Electronics in 1968, about the time the company was beginning to work on a computer-driven automation system. Applied Magnetics owned the company for a few years before selling to Cetec Automation.

Not one for retirement, Schafer started his current company, Schafer International, in 1969. In 1986 he founded Schafer Digital, where he worked on a new design for a PC-based automation and traffic system. He sold a few systems and then sold the company, he said.

Schafer's background is steeped in broadcast engineering and goes back to his hometown of Hammond, Ind., where he learned to fix radios as a teen at a repair shop.

"I was building crystal sets and generally fascinated with making radios work and listening to them. Radio was very, very young at the time," Schafer said.

Schafer received his first FCC operator's license in 1942 and went to work for his hometown radio station WJOB(AM).

He was delighted to bring home \$35 a week playing 78 rpm records and 16-inch transcription discs.

The following year, Schafer went to work for WOWO(AM) in Fort Wayne, Ind. The 50 kW station served as a good training ground for a young engineer.

Station engineer

"I learned how to change the big water-cooled tubes in the transmitter that took up two complete floors of a very large building. Very fun," he said.

After a stint in the U.S. Army Signal Corps during World War II, Schafer returned to WANE(AM) in Fort Wayne where he worked on the air, sold commercial time and fixed the equipment.

"I became a combo operator of sorts. Times were tight and stations couldn't afford an engineer and announcer. I was an engineer sitting between two turntables and with a microphone in front of me," he said.

After WANE was sold, Schafer moved south to Norfolk, Va., to be chief engineer and assistant manager of WNOR(AM).

Schafer set out for California in 1951 and landed a job with NBC Hollywood, then home to some of the biggest radio shows off the day, as a summer vacation relief engineer.

"Bob Hope, Dinah Shore, Jerry Lewis and Dean Martin. I think those were the last of the golden years of radio. It was

fantastic," Schafer said.

It was while at NBC that Schafer became aware of a new FCC ruling allowing for radio stations that were nondirectional and 15 kW or less to operate transmitters unattended by remote control. With the help of fellow NBC engineer Bill Amidon, Schafer ordered several phone lines installed between his garage and Amidon's basement.

Stepping switch

"The key was you had to be able to meter and simultaneously you had to be able to raise and lower and turn things on or off. The logical way to do it was with a stepping switch," Schafer said.

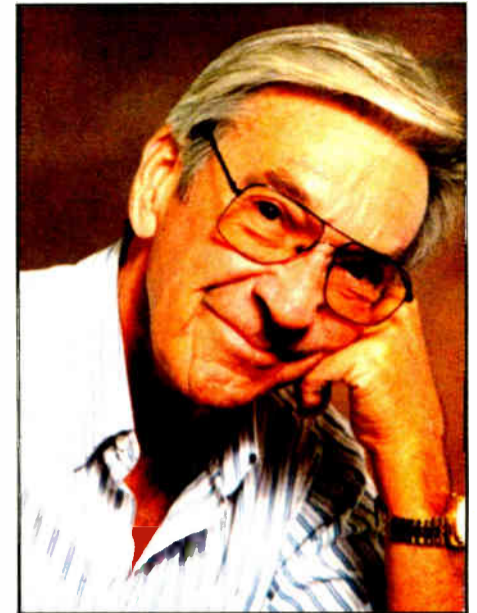
Using an old rotary phone, Schafer incorporated relays to raise or lower a specific element after a number was dialed.

"You could dial up number one for plate voltage, maybe two was plate current and maybe three was antenna current. A little meter would show the reading. Then we would have the relays set up to do the function," Schafer said.

The Schafer remote control system marked the birth of Schafer Electronics in 1953. After working out the bugs the first remote control unit was installed at KROW(AM) in Oakland, Calif., Schafer said.

It wasn't until 1957 that the FCC amended the rules to allow for the remote control of all broadcast transmitters, thanks in part to NAB field tests filed in 1955 using Schafer's remote-control system.

Besides building remote-control



Paul Schafer

equipment and automation systems, Schafer was instrumental in assisting the FCC in field tests demonstrating the worthiness of FM in 1965.

"Prose Walker was director of engineering for NAB and wanted to show the world that the United States' proposed standard for broadcasting FM should be adopted by the world. He thought it would help if we could feed a stereo signal to a satellite and get it back," Schafer said.

Schafer used several Ampex portable recorders in the middle of the Mojave Desert near Barstow, Calif., to record music and chronicle the tests. The recordings later were played for international

See SCHAFFER, page 14 ►

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Disaster

► Continued from page 1

The group is called the Partnership for Public Warning. The public-private partnership comprises leaders from emergency management, government, broadcast engineering and private business.

Warning deliveries

Members are working to improve the collection and delivery of emergency warning information. They have appointed a board of trustees and hope to open a Washington headquarters and name a permanent executive director before the end of the year.

The organization was formed after the Sept. 11 terrorist attacks following debate over whether an activation of the Emergency Alert System should have taken place in New York and Washington.

Local officials elected not to run emergency warnings the day of the attacks citing lack of any forewarning. The nation's



Photo: Andy Clevenger, Mitre Corp.

Partnership for Public Warning Chair Peter Ward, left, talks with George Nichols, vice president, Dialogic Communications Corp., and Ken Putkovich, chief of dissemination systems, National Weather Service, at a PPW meeting at Mitre Corp.

Quad Sues Harris & Sage Over EAS

by Randy J. Stine

KANSAS CITY, Mo. The company that claims to hold the patent on the Emergency Alert System has sued an EAS equipment manufacturer and its distributor for patent infringement.

Quad Dimension Inc. filed suit in U.S. District Court for the Western District of Missouri in early January against Sage Alert Systems Inc. and Harris Corp.

The complaint states that the two companies have been selling various "emergency alert systems and/or devices" that infringe upon Quad's patent for EAS. In the suit, Quad has asked to be awarded an unspecified monetary amount in damages. No trial date has been set.

Quad Dimension's patent claim to the technology that EAS is based upon has been clouded in controversy. In 1992, Quad received a patent from the U.S. Patent and Trademark Office for its SAFE (Storm Alert for Emergencies) technology.

Quad managers believe their patent claims cover the Emergency Alert System adopted by the FCC in 1994.

Quad sent letters to 1,500 broadcasters in early 1999 requesting they pay royalty fees for the use of its patent for EAS. The letters asked for a royalty fee of \$240 for 1999 and annual payments of \$180 beginning in 2000 to continue for the life of the patent.

It is unclear whether many broadcasters, if any, signed agreements to do so.

The United States Patent and Trademark Office has reexamined the patent twice, both times at the request of the National Weather Service. The NWS uses encoding similar to Quad's SAFE called the NOAA Weather Radio Specific Area Message Encoding. The weather service says its encoder was developed first and is the basis for EAS.

The PTO's latest ruling, in the fall of 2000, allowed the majority of Quad's claims but rejected several. Quad Dimension appealed to the Board of Patent Appeals and Interferences. A source at the U.S. Department of Commerce, which oversees both the NWS and PTO, said the appeal is pending.

Harry Fleck, Harris' senior intellectual property counsel, said in a statement that Quad Dimension's suit against the company is without merit.

"The patent in question supposedly covers aspects of the Emergency Alert System. Due to the controversy surrounding the issuance of a patent directed at this standard, the U.S. Department of Commerce filed a second petition for reexamination of the patent, resulting in rejection of the claims by the PTO. The final outcome is pending on appeal filed by Quad Dimension," Fleck said.

Mike Fessler, president of Quad Dimension, said the company was exercising its legal right to defend its patent.

"We believe that the equipment manufactured by Sage infringes upon one or more of our claims," Fessler said. He declined further comment.

Prior to suing Sage and Harris, Quad Dimension had only targeted broadcasters for royalties in regards to their patent.

In a letter to Radio World in 1999, Fessler wrote, "Some broadcasters are asking why QDI is not asking manufacturers of EAS hardware for licensing agreements instead of them. The reexamined SAFE patent encompasses a system that contains emergency warning location and types codes that are interjected, transmitted and received using the AM/FM and TV broadcast channel. The hardware being sold by EAS manufacturers is a subset of the patented system."

"Broadcasters are the ones using claims 1-17 of the SAFE system," Fessler said. "The box cannot perform the functions of the SAFE patent."

Sage Alerting Systems Inc. produces the Sage ENDEC Emergency Alert System encoder/decoder, which is marketed by Harris. Attempts to reach Sage officials for comment were unsuccessful.

Primary Entry Point stations were readied if President Bush had wanted to address the nation through an Emergency Action Notification message.

Some within the emergency alert community argue a warning could have helped those in the north World Trade Center tower, which collapsed approximately 39 minutes after the first tower fell.

The FCC also asked stations to suspend EAS tests temporarily to help avoid public panic.

We need a new warning system that will reach more people. What we have now is quite ineffective.

— Peter Ward

Defense contractor Mitre Corp. hosted an organizational meeting last November. The Bedford, Mass., company gave \$500,000 as start-up money. Mitre is a not-for-profit firm that provides information technology support to the government.

PPW officials say the group's goal is to open a dialogue among civil defense planners and private parties to discuss ways to make warnings more efficient and to figure out the best way to get information to specific populations in the event of further terrorist attacks in the United States.

The initiative's leaders also say certain facets of EAS need improvement and that any new warning system should incorporate new technologies available to deliver disaster information. Those include personal communication devices such as cell phones, pagers and e-mail alerts. They say broadcasters will continue to play a key role in any new system.

"We need a new warning system that will reach more people. What we have now is quite ineffective," said Peter Ward, chair of the board of trustees for Partnership for Public Warning.

He is former chairman of the Working Group on Natural Disaster Information Systems under the National Science and Technology Council and former geophysicist with the U.S. Geological Survey.

"EAS is based on 1950s technology. New technology is not being implemented because there is no clear direction and standards. There is no clear definition of what the role of government should have vs. private industry. We need a clear vision."

Ward said entrepreneurs developing "wonderful new warning systems" are finding they cannot get funding for their research and development. He hopes the group eventually will be able to give financial assistance to those in the product development process.

Funding for the partnership will come from public and private sources, Ward said. The organization is talking with officials from the Federal Emergency Management Agency and other governmental agencies about receiving funding. He said it hopes to raise \$2 million from government and industry sources by the end of the year to pay for travel and conferences.

Funding basics

"We want a 50/50 split on funding from public and private (sources). We will eventually sell memberships to raise funds and also apply for government grants. Membership will consist of private businesses and organizations from government and academia," he said.

FEMA official Tim Putprush said the agency is looking for ways to use the new initiative.

"We're actively engaged with PPW. (FEMA) has identified things that can be worked on. I think they can help develop

a comprehensive warning plan," Putprush said.

Richard Rudman, chairman of the EAS National Advisory Committee and the Los Angeles County local emergency committee, said the events of Sept. 11 have brought the issue of emergency public information to a higher level of national priority. Rudman also serves on the PPW board of directors.

"It's clear that we have to go beyond EAS. We're trying to create emergency lanes on as many different information highways as we can and to have them all connected with the same warning protocol. We have to extend warnings into areas where they haven't gone before," Rudman said.

He hopes to have groups sharing information to develop a common warning language that ultimately can be placed in the public domain without being clouded by the fear of charges of patent infringement and other encumbrances, similar to the current Quad Dimension Inc. dispute over the patent for EAS protocol (see sidebar).

"We know we have a lot of people studying warnings and developing great new technology, but they're not talking to each other. The PPW hopes to bring all of those groups together," Rudman said.

The PPW hopes to work with the consumer electronics and wireless

See DISASTER, page 7 ►

Disaster

► Continued from page 6

communication industries to form a consensus between emergency officials and equipment manufacturers, Ward said.

"Our vision for the future is that every piece of consumer electronics that people buy should have warning capability built in to provide warning information to an individual that they have a personal interest in," Ward said.

That could include using technology such as an "e-chip" that could activate warnings through personal communication devices, computers and set-top boxes, not just radio or television.

Such a device could monitor warning information constantly and activate when the appropriate warning was issued, Ward said. "We believe a warning system could be integrated into society and be omnipresent in many different areas. We have to define where the points of interoperability need to be to be able to put standards in place."

It is clear that we have to go beyond EAS.

— Richard Rudman

The cost incurred by consumers for new technology could be an issue, Ward said. "In large quantities, e-chip technology may only add \$1 to the cost of a radio. Eventually it will become much cheaper. Certainly in most cases it's under \$10 right now."

Ward said it could take as many as 10 years to have consumer electronics manufacturers producing the necessary equipment to allow for time for further testing and development.

The chips of the future could even give people warnings in a specific language, Ward said. "This is not science fiction. This is technology that is already accessible at the moment," he said.

Jeffrey Joseph, vice president of communications for the Consumer Electronics Association, said the trade group would be willing to listen proposals aimed at strengthening the current warning system.

"If it's for the benefit of the country, we would be happy to discuss ideas. A lot would depend on whether there is demand for that type of technology in the marketplace," Joseph said.

The wireless communications industry has generally opposed any kind of federal mandate or requirement to develop such technology, said Travis Larson, spokesman for the Cellular Telecommunications and Internet Association.

Larson said there are services available now, such as weather.com, that offer weather alerts via the Internet and Personal Digital Assistants. "We would certainly examine the situation and see if there is a need," Larson said.

Ward said the PPW's intent is to avoid any kind of government mandate requiring compliance by broadcasters and equipment manufacturers with any new warning system.

"By involving industry in developing standards and approaches, we aim to avoid any government order. We hope to create an environment where business can see opportunities and develop them," Ward said.

Art Botterell, ex-broadcaster and former member of the California Office of Emergency Services, said EAS is a patchwork of technologies and procedures with no means of coordination.

"The history of warning systems in the U.S. is filled with shoot-from-the-hip local solutions and bits of sound-bite engineering that offer an illusion of security but fails to deliver," Botterell said. "All of the stakeholders from state and local emergency officials to the media

and equipment manufacturers must come together to create a coherent national strategy."

Botterell serves on the PPW board of directors.

Some in the broadcast engineering community disagree with new efforts to make any new warning system cutting-edge.

"My advice would be to keep things simple. Simple and reliability go together," said Burt Weiner, former chief engineer for several Los Angeles radio stations, now a technical consultant. "The more sophisticated things are, the more they are prone to failure."

In addition to finding office space in the nation's capitol and naming a perma-

nent executive director, Ward said the new partnership's first steps would be to formulate a long-term national strategic plan and develop a migration plan.

"We won't be able to draft this plan overnight certainly. We want to get the best people we can on board to get their input and thoughts. Then maybe have a plan in six to eight months," he said.

He said the group's new executive director will be someone with experience in warning systems, skill in leading an association and knowledge of the "players" involved.

Information on the Partnership for Public Warning is available online at www.partnershipforpublicwarning.org.

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IBOC Q&A

Licensing Fees To Be Levied

This is one in a series in which Ibiqity Digital Corp. answers questions about how to implement in-band, on-channel digital audio broadcasting. Broadcast Business Development Director Scott Stull answers here. Past answers are posted at www.rwonline.com under the tab "IBOC DAB."

Q: I read in Radio World that Ibiqity is basing its IBOC licensing fee on a station's FCC annual regulatory fee. How do the licensing fees and FCC fees compare?

A: Ibiqity Digital is basing its IBOC

software license fee on a multiple of a station's FCC regulatory fee. A station would pay a one-time license fee of 15 times its annual FCC regulatory fee for a perpetual license to Ibiqity's IBOC software.

This software would come pre-installed in excitors manufactured by Ibiqity's licensed development partners, including Broadcast Electronics, Harris and Nautel, with others to follow.

Ibiqity adopted this tiered pricing model to be equitable to all broadcasters, both large and small, in all markets across the United States. Lower power stations and stations in smaller markets would pay less for software licenses than those stations able to reach more listeners and thereby reap greater reward from the transition to IBOC.

Currently, the annual FCC regulatory

fees range from \$250 to \$4,550. This corresponds to a license fee range of \$3,750 to \$68,250 for a perpetual license. Non-Commercial Educational stations, or NCEs, that do not pay a regulatory fee would pay the lowest amount in the range.



The median licensing fee for all U.S. stations would be about \$12,900.

Ibiqity also plans to offer broadcasters a payment plan for license fees to distribute the cost over a number of

years. This payment option would allow a broadcaster to pay yearly an amount equal to 2.8 times their station's FCC fee for 10 years. Under this option, yearly payments would range from \$700 to \$12,740 with a median payment of \$2,400.

Station licenses also include terms whereby Ibiqity would share in the revenue generated through IBOC's auxiliary data capabilities over and above the revenues generated from a station's primary audio programming.

Ibiqity would receive 3 percent of additional revenues, if any, generated from new revenue sources that IBOC would enable, such as on-screen or scrolling advertisements; on-demand weather, traffic or news; subscription services; e-commerce applications such as "buy" buttons; and from leasing data capacity to third-party content or applications providers.

Ibiqity elected to use a percentage-of-revenue model to ensure that stations only pay a data royalty if the stations increase revenues through exploiting the wireless data opportunities that IBOC affords.

The median licensing fee for all U.S. stations would be about \$12,900.

This licensing model is consistent with those of other high-end, low-volume software applications and reflects a much smaller component of the licensing revenues Ibiqity will receive compared to those from manufacturers.

To put it in perspective, the yearly software license cost is equivalent to about 1/60th of a share point for a station. Increasing listenership by that amount — or preventing that many listeners from choosing other digital mediums — would offset the cost of licensing. Ibiqity's technology will bring great value to the broadcast industry through increased quality and reliability of service, listener retention, new programming opportunities and the promise of additional revenues from wireless data.

Any questions concerning licensing Ibiqity Digital's IBOC software may be addressed by phone at 877-501-EASE (3273) or by e-mail at ease@ibiqity.com.

Send your IBOC questions to radioworld@imaspub.com.

Radio World welcomes other points of view. ☺

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IBOC Fees

► Continued from page 1

IBOC rollout before it gets a foothold.

Although Ibiqity began discussing some aspects of this policy last year, details are emerging from the technology developer and from broadcasters as they begin to discuss the concept.

Like Microsoft

A NAB2001, Ibiqity President and CEO Robert Struble told attendees that his company intended to charge broadcasters licensing fees to use its in-band, on-channel digital audio broadcasting technology.

The fees would be separate from costs to purchase equipment, and would be based on a formula derived from the FCC's annual regulatory fees.

He likened Ibiqity to Microsoft and said, "We're a software company. If you buy a transmitter, you'll need new software from us."

Charging purchasers for software and upgrades is typical in other industries, such as computers, but it's a bold concept for broadcasting technology. Typically a station buys a piece of hardware and the financial obligation is finite.

Ibiqity executives say they chose an equitable way to distribute the decade-long development costs for IBOC and that, as part of its business plan, it needs to start generating revenue.

"We're trying to come up with a standard pricing approach. We've come up with a model that works across classes of stations," said Senior VP Jeff Jury.

In addition to broadcasters, Ibiqity is working with transmission and receiver companies — transmitter manufacturers and transmission-related equipment makers, as well as receiver component makers, chip manufacturers and automakers.

Will broadcasters accept the fees?

Part of the answer may lie in Ibiqity's ownership and business partners. Company shareholders include most of the major broadcast groups. It has licensing agreements with transmitter manufac-

turers Broadcast Electronics, Harris and Nautel, and with receiver manufacturers Kenwood, Alpine, Harmon Kardon and Visteon. Ford recently took an undisclosed equity position in Ibiqity.

We can't just keep never making money.

— Jeff Jury

In addition to broadcast stockholders, Ibiqity also has Wall Street investors who presumably want a quick return on

their investment.

Ibiqity has spent millions developing IBOC technology and expects to recoup those costs, as does its equipment partners.

"Everybody from each sector would say, 'Charge the other guy'" in recouping costs, said Jury. "We're trying not to burden any one sector."

Some broadcasters familiar with the station fee plan assume Ibiqity wants to charge stations now because it cannot wait to recoup costs from its portion of the IBOC receiver sales.

When asked about the timing, Jury said, "As a business, we can't just keep never making money. We need the money now in the sense that we're starting the rollout now."

Scale

He said the company won't become succeed only from broadcast license fees, that eventually it will make most of its income through receiver sales.

The fees work like this: Annual FCC regulatory fees for radio stations range from \$250 to \$4,550 based on station service, power class and size of population served. A station would pay Ibiqity a one-time licensing fee calculated as 15 times its annual FCC regulatory fee.

Thus the range for a one-time perpetual license would be roughly \$3,750 to \$68,250. Ibiqity says the median one-time licensing fee would be about \$12,900.

Stations also could choose to pay over a 10-year period. (See "IBOC Q&A," page 8.)

"If you look at those numbers, I don't think it's an onerous amount to pay for digital radio," said Jury.

Some broadcasters feel differently.

Members of Ibiqity's own broadcast advisory rollout board, made up of owners and engineers, advised against the fee system.

"They're going to have to come up with a plan for broadcasters to buy a new transmitter, pay, and be done with it at that point," said one member, who characterized the fees as a "major stumbling block" in the rollout.

"I don't think they've thought them through," said another advisory board member. "If they're trying to entice broadcasters to go digital and require us to spend on average \$150,000 just on the hardware, it certainly reduces our enthusiasm."

"If they were looking to encourage development, at a minimum, they would defer software payments for a year or two, so we wouldn't take a hit all in one year."

One broadcaster not on the advisory board said that if his company were asked to cut a licensing check today for all the stations they plan to convert this year, the total would be \$1 million.

"There's no company that has a million unallocated," he said.

Noncommercial stations are exempt from the FCC's regulatory fees, so they would pay the lowest IBOC licensing fees. But some of them protest the levies as well.

In comments submitted to the FCC about the National Radio Systems Committee report on Ibiqity's FM IBOC system, the Rocky Mountain Corp. for Public Broadcasting wrote that its stations are "outraged at this unprecedented use fee plan."

One unnamed manager wrote to the
See FEES, page 12 ►

IBOC Lauded, Queried

In the previous issue, Radio World began publishing comments submitted to the FCC about the National Radio Systems Committee report on Ibiqity Digital Corp.'s FM in-band, on-channel digital audio broadcasting system.

Station groups, both commercial and noncommercial, made up the bulk of the filings, along with some transmission and receiver manufacturers, trade associations and public interest groups. Most of the remarks were positive, while some criticisms were lodged. Radio World is excerpting comments over several issues.

"Overall, Clear Channel has been pleased with the performance of the IBOC system on the Clear Channel test stations. Moreover, the introduction of IBOC has not caused any disruption to these stations' existing operations, nor has there been any degradation to the analog broadcasts. ...

"The commission should clarify that it is no longer pursuing alternative approaches for terrestrial digital audio broadcasting. Ibiqity has demonstrated that IBOC works, and the NRSC has validated Ibiqity's findings. The commission now has sufficient evidence to terminate consideration of any out-of-band solution for terrestrial DAB. This move will encourage receiver manufacturers to include IBOC in future designs."

Jeff Littlejohn
Senior Vice President, Engineering
Clear Channel Broadcasting Inc.

"We see the adoption of the IBOC FM system as providing a potential opportunity for important programming that serves the public interest, including: assisted-living services, such as radio reading services for the print-impaired and radio captioning; public safety services, such as weather alerts, traffic safety and national security notifications; foreign language programming and audio-on-demand. ...

"Without the commission's direction and oversight ... it is not clear that the expanded service capability of the proposed IBOC FM standard will result in the offering of new program services to the listening public. Indeed, because datacast business services are expected to be more lucrative and less costly to produce than new program services, one can expect datacast services to predominate. It is also unclear whether consumer electronics manufacturers will produce radio receivers capable of selecting multiple program services offered by an individual broadcast station unless they are encouraged to do so.

"We also urge the commission to assess the cost of implementing the Ibiqity IBOC FM system to ensure that the cost is not excessive."

National Public Radio

"The first point is that this was done without having first asked the public if they actually regard Digital Audio Broadcasting worth the potential costs compared to the proposed benefits.

"Lackluster sales of DAB Eureka-147 units in Europe indicate that while the increase in sound quality was dramatic in

the upgrade from AM to FM in the 1950s, now in the 21st century, the minor increase to 'near-CD quality' may be received with a huge yawn of indifference by the public and active hostility by a government edict that was not market tested first. ...

"Consider that the 'auxiliary services' proposed by DAB supporters has already been available with RDS-enabled radios since 1979. The public's response was nearly nonexistent. Thus, it is very likely that IBOC promises much expense and frustration for citizens and little perceptible gain."

Christopher Maxwell, Secretary/Treasurer
Virginia Center for the Public Press

"CEA concurs with the conclusions in the NRSC FM IBOC Report, and urges the commission to act swiftly to adopt a single standard for FM IBOC technology. CEA further urges the commission to ensure that all receiver manufacturers will have fair and reasonable access to IBOC DAB technology, and to ensure the prompt correction of any limited interference that might occur when FM IBOC DAB is introduced. ...

The commission should mandate that an FM station's main audio program material be broadcast over the IBOC DAB signal.'

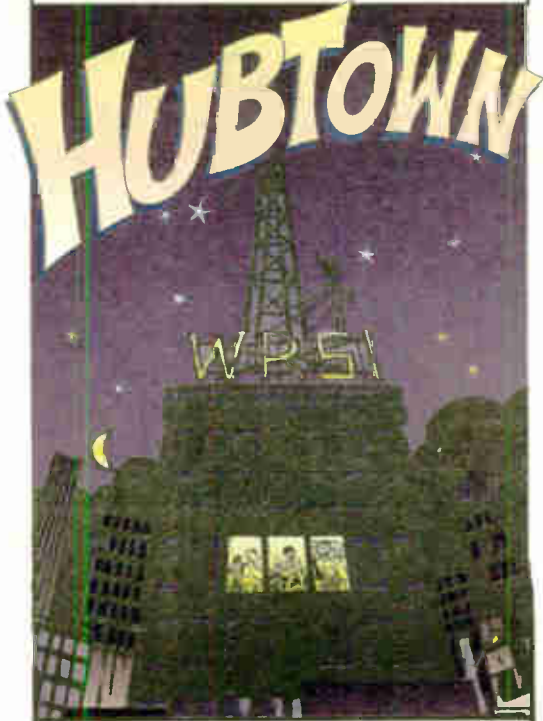
— CEA

"The NRSC FM IBOC report on which CEA is commenting here is only a report on the performance of Ibiqity Digital Corp.'s FM IBOC DAB system. It is not an FM IBOC DAB standard. The commission must specify the technical parameters of the IBOC DAB signal to be transmitted by FM broadcasters in order for all receiver manufacturers to have confidence that the equipment they build will work for anyone listening to an FM IBOC DAB signal anywhere in the country. ...

"The commission should mandate that an FM station's main audio program material be broadcast over the IBOC DAB signal. If some broadcasters were to forgo audio programming and use their IBOC DAB signals to transmit non-audio content, then consumers would have little reason to purchase IBOC DAB audio receivers, and receiver manufacturers would therefore have little reason to produce them. This would severely slow the implementation of IBOC DAB, and perhaps threaten the transition to terrestrial digital audio broadcasting altogether. ...

"All intellectual property included in the standard must either be available free of charge to those wishing to use it, or it must be licensed under reasonable terms in a non-discriminatory manner to anyone who wishes to use it."

Consumer Electronics Association



WHEN A STATION NEEDS INSTALLING, ENGINEERS GET NO SLEEP...



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HEY! THAT HEATS UP FAST!



I CAN'T CRIMP ANOTHER MOLEX



PEPPERONI, PINEAPPLE AND SARDINE PIZZA?



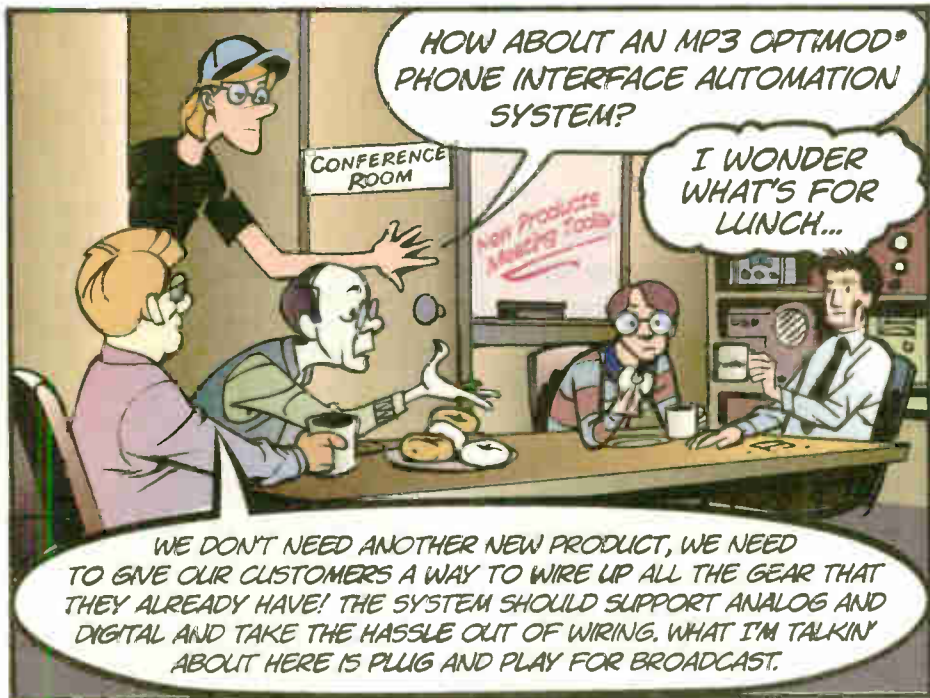
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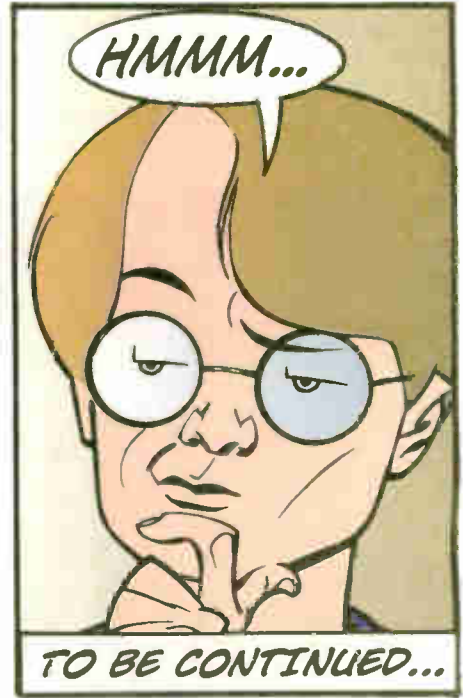
I WONDER WHAT'S FOR LUNCH...

WE DON'T NEED ANOTHER NEW PRODUCT, WE NEED TO GIVE OUR CUSTOMERS A WAY TO WIRE UP ALL THE GEAR THAT THEY ALREADY HAVE! THE SYSTEM SHOULD SUPPORT ANALOG AND DIGITAL AND TAKE THE HASSLE OUT OF WIRING. WHAT I'M TALKIN ABOUT HERE IS PLUG AND PLAY FOR BROADCAST.



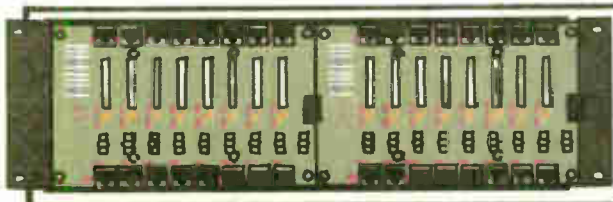
SORRY TO INTERRUPT, BUT THE NETWORK IS UP AND RUNNING!

ALREADY!?

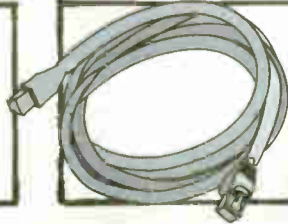


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IBOC Fees

► Continued from page 10
FCC. "I think it is unconscionable that they are asking the FCC to adopt their sole technology as the only system and then charge every station an annual use fee on top of the fees you will already pay to Harris etc. that will be built into their digital equipment if and when you decide to buy their transmitter."

One noncommercial manager said, "This is going to kill noncommercial stations." He added that public radio stations, which typically vie with public TV for grant funds for equipment purchases, face added pressure from TV's mandated digital conversion.

The most sense'

Some commercial station sources pointed out that not all noncoms have the same resources and felt those stations also should be charged a sliding scale. Other commercial sources did not begrudge the noncoms getting the lowest fee.

When asked about the concept, Jury said Ibiqity decided the model it developed "made the most sense."

Ibiqity has been discussing the fee plan with its investor broadcasters and other station owners, distributing "Memorandums of Understanding," precursors to contracts.

Several broadcasters who spoke to Radio World suspect the Ibiqity fees are up for negotiation and hope to see them reduced or delayed. It's not clear if any have signed licensing fee contracts with Ibiqity, which considers that information confidential.

Some broadcasters think early adopters might get a break. But other broadcast sources don't believe there are deals to be had. Some feel that the biggest groups, Clear Channel or Infinity, would negotiate the terms and that all other groups and individual stations would need to fall in line.

One such source said his company lawyer termed Ibiqity's memorandum

language "weasel wording that will be meaningless in negotiating."

Ibiqity says there will be no deals, not for its investor broadcast groups, nor for early adopters, and that there will be no bulk station discounts.

"What we're trying to do is put information out there that we plan to stick to," said Jury. "It doesn't make sense if we change it for each person. We think that this pricing model, which is fair, already takes that into account," said Jury.

He said the fee concept has been in its business model for several years. Executives had discussed passing through its development costs onto the equipment costs, as suggested by some broadcasters,

Some radio stations could end up paying fees to a company owned in part by their competitors.

but decided the licensing fee system was more equitable.

Manufacturers close to IBOC development disagreed on whether licensing fees could impede the rollout.

Data fees

Another part of the fee plan concerns revenues stations would make from ancillary data services potentially possible using IBOC technology. Ibiqity wants 3 percent annually from station revenues generated from the IBOC data services.

How Ibiqity intends to police this is unclear. The situation invites stations to hide such revenue, sources said. Others said it might be difficult for commercial stations even to calculate their data revenue if, for example, they had given data services to advertisers as a value-added item.

Sources said Ibiqity's memorandum states that it has the right to audit station

books twice a year to determine the real revenue from the data services, something some companies strongly oppose.

Although Jury did not confirm or deny this language, he said it would not be unusual for such a software fee license contract.

"We're not trying to get into people's books, we're trying to get into the data business." He said the process of calculating revenue from data is a "gray area" that would have to evolve.

Observers said Ibiqity may demand the right to audit a station's books but that doesn't mean the company would actually do it, and termed the language standard contract boilerplate.

Another gray area is how a station would pay for upgrades.

Theoretically, the fee only gives the station the right to use the software in the gear at the time of purchase. An upgrade could require another licensing fee.

This situation is still under discussion at the company. Ibiqity doesn't want to alienate purchasers by charging for software upgrades immediately.

Another question is what happens when a station is sold. Would the terms of the licensing agreement remain with the facility? It's pertinent, as the FCC processes 3,000 to 4,000 radio transaction applications each year.

Several sources hoped the FCC would question Ibiqity about the licensing fee issue, but a source close to the commission said he doubted the agency would "put a wet blanket on this transition by getting into the fees."

Similarly, the NAB and NRSC do not have a position on the fees. ●

AM IBOC, Daytime Only?

by Leslie Stimson

Will digital AM radio be limited to use only during the day?

A group of engineers evaluating the proposed AM IBOC system of Ibiqity Digital Corp. plans to recommend that it be used, but only during daytime hours.

Members of the DAB Subcommittee of the National Radio Systems Committee have concerns about potential interference to first- and second-adjacent channels if AM IBOC were used, according to its draft report circulating among members in late March.

'We could not endorse AM IBOC at night.'

— A member of the NRSC DAB Subcommittee

"With the data we had, we could not endorse AM IBOC at night. There's too much potential for interference. There were real concerns brought on by the way AM propagates at night," said a committee member.

AM IBOC places digital carriers under and 10 kHz on either side of an AM station's channel. Those digital carriers sit in the first-adjacent channel of the next station, giving the potential for interference.

'Extreme' interference

Ibiqity tested nighttime ground-wave service. It has not tested its system for AM stations using protected skywave service at night.

In its report on AM tests submitted to the NRSC, Ibiqity stated this about its ground-wave nighttime tests:

"Due to the extreme levels of interference experienced at night in the AM band, the digital system provided a more restrictive nighttime service area. The system provided digital service to the 10 millivolt per meter contour.

"In some cases, digital coverage extended to the 5 mV/m contour. ... As is the case with daytime coverage, the blend to analog feature ensures that all existing listeners will continue to receive the station's programming. Nighttime coverage will improve significantly with implementation of the all-digital system."

See IBOC DAY, page 14 ►

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◆ NEWSWATCH ◆

NRB President In, Out

NASHVILLE The National Religious Broadcasters was seeking a new president after its board accepted the resignation of Wayne Pederson at its convention in February. He had been in the new position only a few weeks after moving from the chairman position in October to succeed the late Brandt Gustavson.

Pederson's departure was precipitated by comments in which he called for broadcast evangelists to be less political, touching off an acrimonious internal debate over the direction of the evangelical Christian media association that represents 1,400 broadcasters. Some board members felt he was trying to move the NRB away from politics. Pederson said that was not his intent.

In a statement released by the NRB, Pederson said he was disappointed and sad to leave, "but would be sadder had a rift resulted from this situation."

The NRB board planned to consider options for an interim president and COO.

Ad Language Stripped From Campaign Reform

WASHINGTON Broadcasters won't take a financial hit later this year on campaign ads.

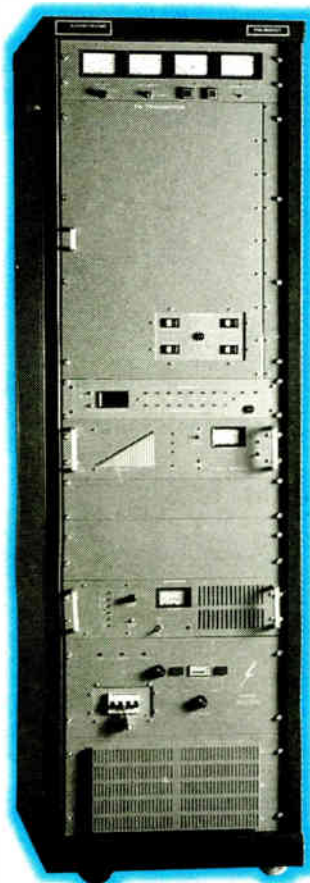
The U.S. Senate passed the House's campaign finance reform legislation in March. The measure was slated to go to the White House next and the president was expected to sign it.

Earlier, the House voted to strike language added by Sen. Robert Torricelli, D-N.J., that would have required TV stations to establish a special, non-preemptible class of ad time for federal candidates.

Some broadcasters had worried that the advertising portion could have been changed to include radio.

Although Torricelli has filed his broadcast ad time provision as an amendment to an election reform bill, several non-broadcast related items must be resolved before the Senate can take up election reform.

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IBOC Day

► Continued from page 12

The interference potential from an IBOC host to adjacent channels rises at night with skywave service because the adjacent signals are much closer in amplitude in than they are in the daytime.

Ibiquity officials and NRSC sources said skywave testing is difficult and time-consuming because it involves a larger service area than in ground-wave testing.

For example, WBZ(AM) in Boston, operating at 1030 kHz, and KDKA(AM) in Pittsburgh at 1020 kHz each has a service area of about 80 miles during the day and roughly 750 miles of protected skywave service at night.

In the interest of moving forward with IBOC quickly, the NRSC did not require the skywave test. But as Ibiquity continues with various tests, it's likely to do skywave testing later to determine the impact of IBOC on station skywaves, company officials said.

Two questions broadcasters would want answered by testing would be whether the digital signal can travel via skywave and what the impact on existing analog skywave service would be.

Protection

Protecting AMs using skywaves at night is the reason many other AMs must power down or go off the air at dusk. Many stations consider those distant listeners valuable, sources said, and would want to protect that service.

Another member said the report was in draft form, but confirmed that the daytime-only recommendation was the direction the committee would take in the document. Most committee members feel it is good compromise, he said.

Overall, the group favors AM IBOC, although, as with the FM system, there are small compromises with possible interference at the edge of some stations' coverage areas.

The NRSC engineers apparently feel that during daytime hours, IBOC AM will be a "tremendous" improvement over analog. Most listeners could not tell IBOC AM audio apart from FM analog in tests, one source said.

The DAB Subcommittee planned to vote on whether to adopt the report at its meeting during the NAB2002 convention this week. If passed, it would be delivered to the FCC. ●

Schafer

► Continued from page 5

engineering groups throughout Europe.

There are those in broadcasting who complain that the automation system Schafer developed more than 45 years ago has led to today's widespread use of voice tracking, which has cost jobs and created a shortage of young talent.

"What you hear on the air in most markets today can be attributed to Mr. Schafer ... automation that plays the same mindless drivel from a satellite or hard drive," said Jay Swafford, a former on-air personality and program director in several markets, including Nashville, Tenn.

Swafford said, who is an audio technician at WTVF-TV in Nashville.

Schafer said he heard many of the same complaints when his automation system became popular.

"In the early days of automation, each station produced what their automation system could assemble. Some of the less-creative air talent created material that was far from the best. I guess it will always be that way," Schafer said.

Programming enhancements

Schafer foresees even more changes for the broadcast industry thanks to advances in automation technology.

"Great minds will continue to find ways to enhance programming, automation and other aspects of broad-



Schafer bought KDOT(AM), Reno in 1959 to demonstrate how efficiently a station could be run with automation.

"Nowhere have I found that Mr. Schafer's invention added to the listenability of radio, just the enhancement of the bottom line for the corporate office.

"Kids have no idea how much fun radio used to be when personality got a chance to shine through the airwaves,"

casting," he said.

Schafer, the father of five grown children, lives in Bonita, Calif. One of his sons, Rob, followed him in broadcast engineering and is currently acting director of technical operations for CBS-TV Newspath in New York. ●

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World Radio History

Cart Chunk Moves to AES, IEC

File-Exchange Specification Will Soon Become International Standard for Radio Applications

by Skip Pizzi

The lack of a file-exchange standard for digital audio + metadata in the radio broadcast environment may soon be a thing of the past.

The so-called Cart Chunk data format has been submitted to the Audio Engineering Society's Standards Committee (AESSC) and the International Electrotechnical Committee's Technical Committee 100 (IEC TC-100). Barring any unforeseen difficulty, the specification should become an official standard under the auspices of AES by mid-2002. IEC standardization may follow thereafter.

AES46

The Cart Chunk specification was developed within the SC-06-01 Working Group on Audio-File Transfer and Exchange of the AES's SC-06 Subcommittee on Network and File Transfer of Audio.

The work was performed under the AES X-87 project, entitled "Radio Traffic Data Extension to Broadcast Wave Files." The output of this effort is a draft standard now being vetted for comment by the Society, under the proposed title of AES46-xxxx (where xxxx is the year of final approval).

Comments will be accepted until June 7, after which any negative comments must be addressed and resolved. Following resolution of those comments, the AES will bless the AES46 draft as an official standard.

The authors of the original Cart Chunk specification and the AES46-xxxx draft are Dick Pierce and Geoff Steadman, two former Orban staffers who determined that such a file-exchange format was necessary when trying to integrate PC-based digital audio workstations and radio automation systems.

Although audio files of known coding type have been possible to exchange with relative ease for some time, the labeling data associated with the files never survived any transfer between systems, and typically had to be transmitted separately and/or manually re-entered following the audio transfer. The ideal solution called for a file-interchange format that could be

broadly implemented across the industry, which would include both essence (audio) and metadata (description) components in a manner that could be automatically interpreted by any manufacturer's system.

and descriptive metadata (e.g., title, running time, outcue, pull date, etc.) into an audio file when production is complete, then transfer that file from the original production workstation to one or more automated playout systems, in compressed or uncompressed form.

As long as all involved systems support AES46, the audio data will transfer com-

Field Name	Characters	Field Description
Version	4	Version of the data structure
Title	64	Title of cart audio sequence
Artist	64	Artist/creator name
CutID	64	Cut number identification
ClientID	64	Client identification
Category	64	Category ID (PSA, News, Music, Commercial, etc.)
Classification	64	Classification or auxiliary key
OutCue	64	Outcue text
StartDate	10	First date for audio cut to be aired (yyyy/mm/dd)
StartTime	8	First time for audio cut to be aired (hh:mm:ss)
EndDate	10	Pull date (yyyy/mm/dd)
EndTime	8	Pull time (hh:mm:ss)
Producer	64	Name of production system used
AppID	64	(vendor/application)
ProducerApp Version	64	Version of production system application
UserDef	64	User defined text
LevelReference	--	Sample value for 0 dB reference level
PostTimer	8	8 time markers after head
Reserved	276	Reserved for future expansion
URL	1024	Uniform resource locator
TagText	Unspecified	Free form text for scripts or tags

Table 1. Data types supported by the Cart Chunk specification are shown with number of ASCII characters allowed in each field.

Such a solution was not intended to force all manufacturers to adopt a common method of representation for audio and descriptive data *within* their systems, but simply to support a standard file-exchange protocol for data I/O that could be converted to/from their respective native formats.

The final result was the AES46 draft, which specifies a manner of identifying audio coding type (from a limited list of possibilities), along with semantics and syntax for expressing most common metadata ("cart labeling") fields used by broadcasters. This will allow a spot producer to write a variety of identification

patibly, and the label data entered in the original production phase will appear in the appropriate places on the automation systems' databases and displays.

A layered approach

Like many other successful standards, AES46 is built upon other broadly accepted standards. The first is the Resource Interchange File Format (RIFF) for audio, better known as the WAVE or WAV file (designated by the file extension .wav), which was specified in 1991 by IBM and Microsoft. Although WAVE files are often thought to inherently and exclusively use linear PCM audio repre-

sentation, WAVE files can actually include many other audio representation schemes, including compressed formats such as the MPEG-1 Audio Layer II or III commonly used by radio broadcasters (.mp2 or .mp3 files).

The WAVE format is simply a standardized *wrapper* that packages the audio data with a series of mandatory and optional headers or "data chunks." The structure of these chunks is established in the original RIFF specification, such that the first four characters of each chunk identify it, followed by 32-bits of data of that type. If a device does not recognize the chunk type, it simply ignores the data in the chunk. This allows extensibility of the format without causing problems in legacy devices.

bext-ok

One such chunk developed by the EBU in 1996-7 is the *Broadcast Audio Extension* chunk (bext-ck), which when added to the RIFF WAVE format defines the *Broadcast Wave Format (BWF)*. This creates a specified subset of the WAVE format, designed specifically for broadcast audio file interchange.

(BWF is specified in EBU Tech 3285 and subsequent Supplements 1-3, and in EBU Standard N22-1997; recommended practice for the format's application is explained in EBU Recommendation R85. See www.ebu.ch.)

The Cart Chunk (*cart-ck*) in turn adds a specified metadata set to the BWF format, as yet another optional RIFF WAVE data chunk. Therefore an AES46-compliant device would read and write RIFF WAVE files of the types specified by the BWF format, including the labeling data defined in the Cart Chunk specification.

The data types included in the current AES draft are listed in Table 1.

The practical result of all this is far greater compatibility, particularly for metadata, when transferring audio files among production and playout systems. A number of leading workstation, automation system and audio card manufacturers already support the draft specification in their current equipment, with others pledging their compliance in upcoming offerings. Following the approval of AES46, it is likely that even more widespread support will emerge.

In the meantime, to learn more about the Cart Chunk specification, its authors have established a resource-rich website at www.cartchunk.org.

Skip Pizzi is contributing editor of *Radio World*.

(Too bad you can't scroll...)

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GUEST COMMENTARY

DSP, On-Air Processing and You

When It Comes to Digital, Bob Orban Disputes
Comments by Donn Werrbach of Aphex

by Robert Orban

In Radio World's interview with Donn Werrbach of Aphex in the Feb. 1 issue, Donn claims that at the purely sonic level, analog is better than digital — that it's a God-given fact, and nothing will ever change it because digital is a quantized and sampled numeric approximation of reality.

This tired old "analog has infinite

resolution and digital does not" argument has been repeatedly disproved. In fact, any analog system has a noise floor that limits its resolution. Assuming perfect hardware, correctly dithered PCM digital is linear and has a noise floor determined by the number of bits in the digital word, because the dither completely linearizes the quantizer. The noise floor in the PCM digital representation limits its resolution,

just as in analog. (PCM is the "conventional" type of digital coding used in CDs and DVD-As, but not in SACDs.)

Both analog and digital have high-frequency cutoff points — in analog, because no system has infinite bandwidth, and, in digital, because an anti-aliasing filter at the system's input must limit its bandwidth to half the sampling frequency to prevent aliasing.

In short, there is no mysterious, "God-given" difference between analog and PCM digital. Both are limited by their noise floors and bandwidths. Further, within any given frequency

band, resolution is determined *only* by the noise floor in that band.

Donn implied that existing DSP chips don't have enough processing power to run the code necessary to eliminate "digital grunge."

I agree that one has to be careful when writing DSP code to use techniques and algorithms that put "digital grunge" below the threshold of perception. Is it rocket science? Some of it comes close.

Deep math

It requires knowing some deep mathematics that are seldom encountered other than in formal upper-university-level engineering courses — "street smarts" and experience are insufficient by themselves to allow a designer to make the transition from breadboard-level analog engineering to DSP, although analog experience certainly helps when complemented by a mathematical background.

The competent DSP systems designer needs to be able to read and understand the professional literature, such as the AES Journal and various IEEE Transactions, which are very math-intensive.

The tired old argument that analog has infinite resolution and digital does not has been repeatedly disproved.

But is eliminating "digital grunge" doable with current DSP? I claim that it is, given sufficient sophistication.

For example, our 8400 product contains DSP clippers that have essentially the same distortion spectrum and peak control as analog clippers. It requires sophisticated nonlinear anti-aliasing algorithms to do this; one has to do more than just naively raise the sample rate. Nevertheless, the current generation of Motorola fixed-point DSPs is more than up to the task, as we have demonstrated.

Donn feels that DSP audio processors don't have algorithms that are as well-developed as their analog counterparts because it's more difficult to "breadboard" in the DSP domain and to test algorithms in real time while listening to program material.

It appears that he is unaware of the current generation of fast-prototyping DSP development tools that allow the designer to put together complex processing systems via a GUI and then listen to the results in real time.

Nevertheless, I choose not to depend on black-box blocks that someone else has designed when I prototype my DSP algorithms. Instead, I use Fortran 95, a

See ORBAN, page 26 ▶

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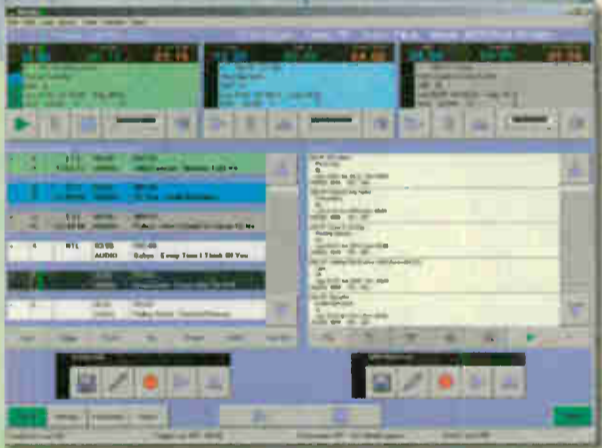
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We also use BSI's software to automate our AM schedule, including music on hard drive. We use a third system for satellite store-and-forward duties. The import routines make it a snap to integrate music and spots from your scheduling software with your BSI logs, and the voice-track editor's drag-and-drop capabilities make having a great hosted sound so easy that any jock will be able to quickly learn it.

The really great part about BSI's digital automation is that you can design as simple or complex of a system as you need in an economical, non-proprietary software and hardware environment. BSI's automation is so feature-rich and flexible that we will never run out of new possibilities for implementing our broadcasting mission. And if you really need a feature that's not already there, chances are good the BSI team will respond to that need in a future release. Where we started with a single PC running BSI's digital automation, the Northwestern Radio Group now employs approximately 17 automation programs at our stations in the Upper Midwest and Florida. KFNW is now down to 12-hour days for manned operation, and our staff is finding more time to be creative, both in the production room and out in the community.

We always like to think we will never need tech support, but I've always been thankful for BSI's 24/7 commitment to us when we DO have a problem. I've even gotten some of those poor guys out of bed in the middle of the night, and they've always gotten us back up and running within a reasonable amount of time. They've even helped us when the problem was hardware-related, and not software.

Yes, we like BSI's digital automation too!

Steve Runck
Staff Engineer
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ROOTS OF RADIO

The Radio Trade Directory of 1925

by Allen J. Singer

With 24-hour access to the World Wide Web, we rarely have to search hard to find information to fill our radio engineering needs. A mere decade ago, the information available was minuscule by comparison. We had to access stacks of magazines and catalogs and make phone calls all day long to find the parts and information we needed.

Now imagine trying to supply a radio station in 1925.

An excellent source for an engineer would be the Radio Trade Directory, a "classified directory of the radio and allied industries." This comprehensive tome contained "the names and addresses of the American manufacturers of everything used in construction, maintenance and operation of Radio Apparatus both Transmitting and Receiving."

This was the engineer's source book 77 years ago.

Radio was still a toddler in 1925. Even so, America had approximately 585 stations coast to coast, and engineers at those stations were pioneers of our modern broadcast engineering industry.

Thousands of companies emerged to build and supply the loop antennas, dials, cabinets, tuning condensers, crys-

tals, batteries, loudspeakers, felt (for the radio bottom), resistors, rectifiers, tubes, transformers, wooden variocouplers, phonograph parts, radio kits, wire and anything else the broadcast professional might need.

Familiar name

Belden, already 23 years old, displayed an ad in the directory, advertising its three big sellers: enameled aerial wire, loop antenna wire and Belden battery cord "for A and B batteries. Replaces tangled wires, saves tubes, and very popular."

Among the hundred or so other wire companies, the directory listed Allied Magnet Wire Corp., Ross Wire Co.,

Springfield Wire and Tinsel, Acme Wire Co., Standard Underground Cable Co. and Super Insulated Wire Co.

As today, tools were a key ingredient to any engineering shop. Stevens and Company sold Spintite wrenches, popular with set builders. Niagara Metal Stamping Corp. sold a set of wrenches and a screwdriver "for the price of a good cigar!" This was advertised for "every radio nut" and they sold "fast because they're low-priced and practical."

Bard-Parker, B&E and Erbcos sold wire strippers, and Burton-Rogers Co. sold Hoyt Electrical Instruments including pocket meters, peep-hole meters,

See 1925, page 30 ▶

Big Station, Bargain Price

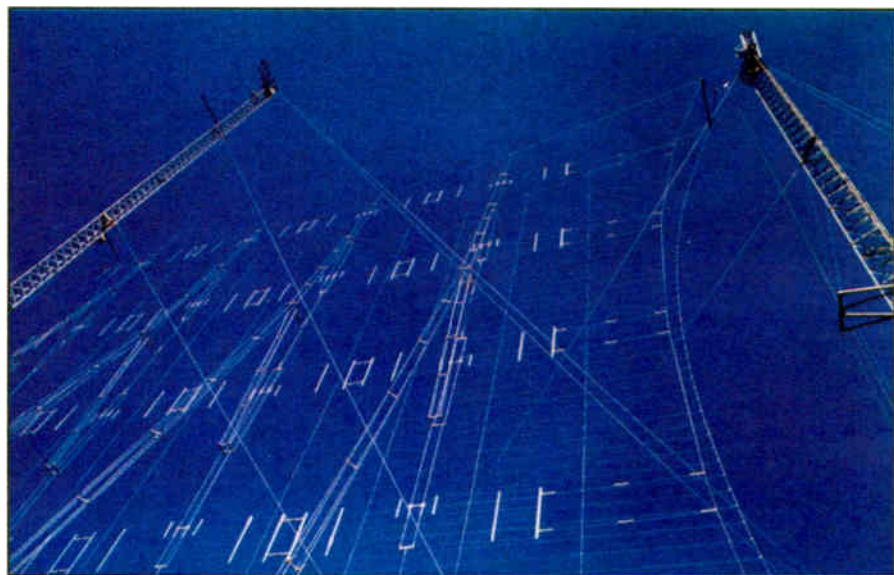
WSHB, the second-largest privately owned shortwave radio station in the United States, is for sale.

The Herald Broadcasting Syndicate, a subsidiary of The First Church of Christ, Scientist in Boston, owns the station, which went on the air in 1989. The facility is in South Carolina, about 45 miles north of Savannah, Ga.

WSHB has two 500-kilowatt transmitters, operating independently into high-gain curtain antennas that serve audiences in North America, Europe, Africa, Mexico, Central America, Cuba, South America, Australia and New Zealand.

"We have the ability to 'slew' or bend the signal off of these antennas so as to reach specific target regions like South Africa, Eastern Europe or Brazil," said the station manager, Ed Evans. "We also have the ability to 'split' signals to two antennas at once. Effectively, we can broadcast on four antennas at once with the two transmitters."

Evans said Herald has decided to shift its focus to program production rather than owning and operating program delivery facilities.



The station cost \$19 million to construct, but the asking price is \$6.5 million.

"The station is in excellent shape and working condition, and is a bargain at this price," Evans said.

So what do you get for your \$6.5 million?

"The station sits on 380 acres of open field and woodlands," he said. "The antenna field and building encompass about 120 acres; the remaining woodlands serve as a buffer. The 19,000-square-foot building holds two ABB 500-kilowatt shortwave transmitters with expansion room for a third transmitter."

Also included are an ABB antenna matrix switcher and control system, which ties the two transmitters into the 12 antennas (six pairs of high/low-band antennas); three 750-kilowatt diesel generators; and ancillary equipment and supplies to keep the station operating.

Most recently, Herald Broadcasting has used WSHB to broadcast religious programs of The Christian Science Publishing Society. Prior to 1997, it broadcast the radio edition of The Christian Science Monitor. It aired sports programs and programs for international broadcasters such as RTE (Ireland) and Radio Netherlands.

"WSHB would be a very good property for an organization wishing to extend its outreach or missionary services," Evans said. "It would also be an excellent way to expand an organization's sports, music or financial programming to an international audience."

Interested buyers can contact Evans at (803) 625-5551, or e-mail to evansc@wshb.com.

— Paul McLane

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World Radio History



Workbench

Radio World, April 10, 2002

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Hot Numbers You Need to Have

by John Bisset

We've been organizing our transmitter site using a list compiled by Mike Patton, a special projects and contract engineer in Baton Rouge, La.

When was the last time you checked backup items like surge suppressors, the UPS or even your alarm system? Green lights on the LEA Surge Suppressor shown in Fig.1 provide an easy method of checking the status of the surge modules.



Fig. 1: Lights on this surge suppressor indicate the status of surge modules.

Do you maintain a current list of phone numbers? The operative word here is current.

The list should include the station hotline and any other jock access numbers. It's frustrating to solve a problem but not be able to notify the jock that

the station is back on the air.

The phone list expands to include the general manager, program director, OD and corporate engineer — anyone in the management chain.

Mike has made it a habit to call management as soon as he arrives at the site.

Mike also suggests you establish a policy of calling one person, agreed upon ahead of time, and letting them serve as the relay to station staff or management. This keeps phone inter-

ruptions to a minimum, alleviating the equivalent of the kids in the back seat whining, "Are we there yet?"

A notebook log for keeping track of typical equipment test meter readings is helpful, and you can keep the emergency

numbers there. In this day of multiple sites, trying to keep all those readings memorized is nearly impossible.

Fig. 2 shows a "quick and dirty" method of logging readings. Defacing the front panels of equipment will drive some engineers crazy, but at least here, the readings were marked with pencil.

Your transmitter site notebook of emergency numbers should include business and emergency numbers for equipment manufacturers, as well as those for consultants and other engineers with knowledge of the station. Do you have someone who cuts the grass? List their numbers, too.

Power and plumbing

Important names and numbers include HVAC, plumbing and electrical contractors. Include a tow-truck operator and any other pro who might need to be called in the middle of the night.

Keep phone books — both business and residential — on hand.

Mike adds another helpful hint, particularly if you have an intern or secretary available. Give him or her the list to call all your numbers and verify that they are correct. Area codes and phone numbers change frequently. Take steps now to have an accurate list in the middle of the night when you need it.

Move on to the utility companies, again both main and emer-

gency numbers. Include your account number and the service and billing address. Keep a copy of each of your utility bills in your notebook, and you've got the list already.

Do you know what the actual street address for your transmitter site?

vice. If you can't remember the code, write it down but do something funny to it. Add a digit to the number or write it backwards. If someone gains access illegally, they can't pretend to be you when the alarm service calls. We all have some great stories about accidental alarm trips. They are not so funny when a station is off the air.

If your site uses a generator, include the fuel supplier and



Fig. 2: Scribble on gear if you must, but at least use pencil.

You can obtain this information from your county's 911/Office of Emergency Operations (OEO). The information can be critical for police, fire, ambulance and utility location purposes. Although many counties are attempting to identify even rural sites, if your transmitter location has been around a while and is remote, you may need to request an address from the OEO. Then make sure the address is listed with the utilities so they have it before an emergency arises.

Your list should include local law-enforcement numbers. If an alarm is used, include the number to the alarm monitoring ser-

vice numbers; again, a copy of the bill is useful. Mike points out that these accounts often are set up by the bean counters. Your official account name may in fact be an ancient station slogan, like Kool 93.

Mike includes the names of a couple of pizza delivery companies that service the transmitter site area. Don't laugh. You may be there for a while.

Make a date with the station's copy machine. Copy all station licenses, FAA authorizations, tower registration numbers and auxiliary services. Include a copy of the AM NRSC measurements.

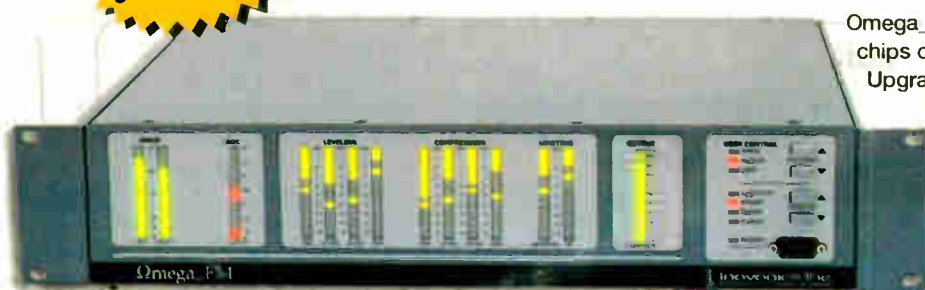
See WORKBENCH, page 24 ▶

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Hear It... Processing doesn't get any better than this.

Bird's Popular Meter Is 50

by Charles S. Fitch

Among the most valuable tools in any RF toolbox is the Bird Model 43 ThruLine Wattmeter. Take it from a man who has fried endless number of IF transformers, transistors and dummy loads in an inept illusive quest for accurate RF information and tuning.

J. Raymond Bird, who had founded the company a decade earlier, invented this practical device in 1952, 50 years ago. More than a quarter of a million wattmeters have followed that unit off the production line.

Bird himself died in 1962, but the model is still made today.



The basic Bird unit isolates and displays the RF power in watts going in just one direction. By tabulating and comparing the power going to the load and coming back (reflected) from the load, important data such as power on the line, transmitter power output, SWR and probable load impedance or load characteristics can be calculated and examined.

Beat but accurate

The RF reading actually is a traveling-wave, rectified sample of the main signal extracted by a loop as it passes through the small section of coax in the meter. Because the length of the loop, intimacy and line in wavelength vary as a function of frequency and hence the proportionate value of that sample, for spectrum flexibility Bird choose to design plug-in "frequency elements."

This unique element system made the meter highly accurate within the frequency range indicated on the element and extended the meter's potential usefulness through most of the RF spectrum.

You may be familiar with the portable Bird 43 and may own, or have borrowed and forgotten to return the elements needed for those parts of the spectrum that we investigate.

My infamous yellow RF toolbox contains the Bird 43 that was given me by RCA Broadcast (remember that?) and elements for the FM band, TV and 950

MHz STL channels.

This might be an original Bird unit — RCA never threw anything out — and so is probably as old as I am. We're both a little beat, but we're as accurate and hard-working as when we were new.

Like small gold-plated shot glasses, the elements slide gracefully into the front of the Bird meter. The arrow points in the direction in which we want to measure the power.

Simple joys

Conveniently, you can rotate the element to change measurement direction without having to power down. The frequency range and the maximum full-scale power that can be read are annotated on the visible top of the element.

Many RF measurements must be made on a continuous basis.

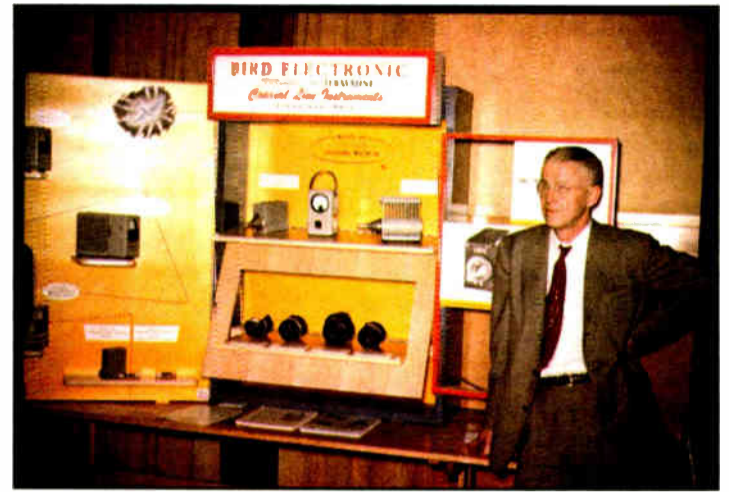
Over the years, permanently mounted

ThruLine Wattmeters for higher power situations were developed by Bird and found their way into transmitter installations. They work the same way as those little Bird 43s.

In the movie "Galaxy Quest," a character states that simple things give the greatest joy. One of the simple

joys for radio engineers is to see that Bird meter peak up, knowing that our attentive work has allowed us to generate the maximum power into a perfect load.

Charles S. Fitch, W2IP1, is a registered professional consultant engineer, a member of the AFCCE, a senior member of



The Late J. Raymond Bird

the SBE, lifetime CPBE, licensed electrical contractor, station owner and former director of engineering of WTIC(TV) in Hartford, Conn., and WSHS(TV) in Marlborough, Mass.

Reach him via e-mail to FitchPE@home.com. 🌐

Workbench

► Continued from page 23

I agree with Mike that this paperwork task can be daunting, but it's time well spent. For a contract engineer, it's billable time. Having one's paperwork house in order is part of good engineering, no matter how little respect it gleams from the staff. You'll sleep better at night.

A trip to Wal-Mart, Radio Shack and Home Depot will ensure a well-stocked transmitter site.

Is the station owner balking at the idea of a well-stocked site? Mike agrees with one engineer who wrote that *you* might not want *them* as a client or an employer!

While you're at Home Depot, consider picking up a travel case for small parts. Brian Edwards of New World Radio in Washington displays one such case in Fig. 3. The cases are compact, and the tops seal well, preventing parts from jumping into adjacent compartments.

Jeff DePolo is a broadcast and communications consultant in metro Philadelphia. He added a few things to Mike's list, making it even more inclusive.

Useful items include a cordless phone, an old 486 PC and a can of pepper spray.

Atop Jeff's list are RF adapters and patch cables. Include some scraps of coax and audio cable for emergencies.

Jeff likes to keep a cordless phone with him, or ensure that the transmitter site phone is equipped with an extra-long cord. Placing a parts order in a room full of transmitters can be impossible with all the noise.

There's another advantage to the long cord or cordless phone. You can talk to the transmitter manufacturer's parts or service staff while looking inside the transmitter, ensuring that you get the right part.

If anything at your site requires a computer for control or programming, put one of your old dumpster-bound 486 computers at the site. Leave it unplugged for lightning protection. You never know when you'll need it. The list of computer-controlled equipment is growing — processors, remote control equipment, RBDS generators and EAS, to name a few.

If legal in your area, consider a can of pepper spray. As Jeff puts it, "You never know. Pepper spray works on bears, too."

Somewhere safe and hidden, keep a copy of equipment passwords and combination lock codes. To simplify combina-



Fig. 3: Brian Edwards displays a travel case for small parts.

tions, buy the "set-your-own" Master combination locks. They're a little more expensive, but worth the money if you need to change combinations due to a staff change.

Jeff joins the ranks of engineers who have experienced fuse failures, but adds critical circuit breakers to the list. Breakers do fail, and for sites with older panels, finding replacements can take a while if the model is not a current one.

In keeping with the redundancy theme, Jeff likes to add an emergency provision for audio should the STL fail. An old Comex unit could come in handy here. A CD changer with a handful of CDs and several custom-cut CDs with IDs is another idea to buy you some time should the link fail.

Though not a problem for most of us at this time of year, ice falling on a Mark or Scala feedhorn can destroy it. With that in mind, Jeff keeps a spare yagi and 100 feet of 1/2-inch line in the truck all winter, just in case.

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 jbbisset@harris.com. 🌐



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Orban

► Continued from page 18
high-level language that allows me to tweak every aspect of the design at the most microscopic level.

At Orban, we have created a custom C++ wrapper around the Fortran that provides the ability to listen to the Fortran-coded algorithms in real time and to tweak multiple, assignable parameters via virtual sliders on the computer's display while listening.

Using this system, I can prototype, test and listen to experimental DSP algorithms much faster than I could prototype back in the days when I was still using a soldering iron and Vector board. Instead of worrying about

rerouting wires and changing parts values, I just change some code, recompile (a matter of a few seconds), and listen to the results. The fluidity of the workflow is quite similar to the old analog days, except for the solder fumes!

In any event, prototyping DSP code by writing it in assembly language and then laboriously debugging it is outdated. There is a time for writing DSP assembly code (to achieve most efficient use of DSP resources in a product), but that time is after the sonics have already been prototyped and optimized.

Building with delay

Delays of more than a few hundred microseconds are essentially impossible to make in analog, whereas in DSP, delay is the cheapest and most funda-

mental building block.

Virtually all DSP is based on manipulating integer sample delays in various complex ways — delays are the “capacitors” and “inductors” of DSP. However, the 8400 Optimod-FM is far more than a digital emulation of analog circuits; the availability of inexpensive delay has let me go to places I could never get to using analog technology because delay allows you to do far more than just emulate capacitors and inductors.

For example, delay lets DSP designers create highly selective filters with no phase distortion at all. These are common as dirt in DSP, but impossible in analog.

As a designer, another huge advantage I have by comparison to the analog days is the ability to use time delays to

“look ahead” at upcoming waveforms, allowing the processing to intelligently adapt itself to the program material at hand.

DSP has taken over from analog signal processing almost everywhere in the real world where serious, professional engineering is expected as a matter of course and reliability is crucial. DSP flies our aircraft and controls our nuclear reactors. This dominance is no accident — DSP more powerful, more versatile, more stable, more predictable, and more “manufacturable” than analog processing.

Finally, Donn feels that there is no current lossy compression algorithm that satisfies his ears.

To impress one's “high end” audiophile peer group, it's easy to make lavish claims about the “inadequacy” of lossy compression. However, this area has been studied with a great deal of rigor by the MPEG committees, using some of the most sophisticated double-blind comparisons between encoded and original material ever done (by means of the so-called ABC/Hidden Reference testing protocol). These tests reveal the *actual* audible transparency (or lack of same) of various lossy compression algorithms at various bit rates, based *purely* on listening.

**It's easy
to make lavish
claims about the
'inadequacy' of
lossy compression.**

I was fortunate enough to be one of the subjects in the 1995 EIA DAR codec tests, which Canada's Communications Research Centre did with the highest degree of rigor and professionalism. This experience certainly opened my eyes to how careful the tests were, and how important it is to be scrupulous and scientific instead of running around spewing personal opinions based on sighted tests.

Sighted tests that attempt to quantify differences close to the threshold of audibility are *never* reliable because no one can voluntarily will away irrelevant factors and expectations, no matter how hard he or she tries.

The results of the various MPEG tests are that some codecs are transparent at sufficient bit rates. (“Transparent” means that people can't tell the difference between the uncompressed and the compressed signals in a statistically significant way.)

Some codecs, like MP3, are not transparent at *any* practical bit rate. Moreover, the transparent codecs, like AAC, are available now, and don't require “100 GHz CPUs” to decode. Indeed, even boring old garden-variety MP2 can be transparent at sufficiently high bit rates.

The author is vice president and chief engineer of Orban/CRL Systems Inc.

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World Radio History

Canada Experiments With Digital-Only

by James Careless

TORONTO With 55 Eureka-147 DAB stations on air in four metropolitan areas, Canadian radio broadcasters are now experimenting with "digital-only" audio and text programming.

The only problem is that few Canadians are able to receive the new services due to a lack of DAB receivers in the marketplace.

"The CRTC (Canadian Radio-Television and Telecommunications Commission) granted each station the right to broadcast up to 14 hours per week of unique DAB programming above and beyond their conventional analog broadcasts," said David Bray, chairman of the Digital Radio Roll-Out Inc. DAB programming subcommittee.

Consortium

DRRI is a consortium of private and public broadcasters charged with making DAB happen in Canada.

"That opened up a wealth of possibilities for us to explore," he said.

For example, last summer, Toronto sports station CJCL(AM), "The Fan 590," used its DAB channel and Web site to broadcast international rugby matches, while its AM signal carried regular programming. This split approach allowed The Fan to air the rugby matches, which otherwise would not have been heard in Toronto.

"We did have some positive feedback from people listening via the Internet and the couple of DAB receivers that are out there at this point," said Fan Program Director Nelson Millman. "As well, it made our lives easier at The Fan, being able to schedule two things at once."

Meanwhile, in Montreal, music station CKMF(FM), "Radio Énergie 94.3 FM," is using DAB to simulcast — and promote — its Web site.

Radio Énergie devotes two hours each evening to one of three Web audio streams, said Charles Benoit, vice president of new media for the station. These are Énergie Rock, Énergie Dance and Énergie Hip-Hop.

In addition, Radio Énergie plans to send text messages to LCD-equipped DAB receivers. These messages will include artist and song names, said Benoit.

"During the upcoming year, we will also be looking at adding weather and traffic reports."

French-language public broadcaster Radio Canada has been experimenting with digital-only programming.

Every Sunday night, the "Par 4 Chemins" ("By 4 Roads") DAB simulcast offers extra information on the subject that the host, Jacques Languirand, is talking about, said Denis Pellerin, director of program development for Radio Canada.

"This information is mostly text, although we have been sending some photographs out to the LCD displays as well."

Beyond these stations, program directors across Canada are developing content for their DAB channels, Bray said. Top Canadian program directors met in Toronto this winter to discuss standards for this new medium.

The goal was "to make sure consumers are supplied with glitch-free service," said Bray, "and that they can get all the added-value offered by DAB anywhere in Canada."

This said, the road to digital-only audio and text services is not without obstacles.

In this instance, the problem is the relative scarcity of DAB receivers. With so few being used by consumers — in large part due to their hefty pricetag and the rel-

We do believe

DAB will come out.

It's a matter of when.

— Denis Pellerin

ative lack of public awareness about the new medium — broadcasters do not want to spend too much money in this area.

"For the past year, we have been in a

waiting phase," said Pellerin. "Before that, we did build a laboratory here in Montreal to see how we would work with DAB radios. Now this has been put on hold, waiting for receivers to come on the market."

"We do believe DAB will come out," he added. "It's a matter of when."

Canadian broadcasters may not have to wait much longer.

General Motors of Canada Ltd. has announced it will be factory-installing AM/FM/DAB receivers in Canadian cars starting this spring, while Radio Shack will start selling Eureka-147 portable radios at about the same time.

Add to the development by Texas Instruments of less-expensive DAB chipsets, and receiver prices should plummet. According to DRRI President Duff Roman, an in-trunk DAB car receiver should end up costing about \$125 in U.S. dollars, or less.

As a result, proponents hope, Canadian



broadcasters will be motivated to create more digital-only content, both to help drive receiver sales and to cross-promote their Web sites. They hope 2002 may be the year that 13 years of effort pay off. ●

MARKET PLACE

Shively: The Iceman Cometh

Shively Labs recently released this photo from its test range in Maine. RF Technicians Norm Hutchins and Sean Edwards are seen testing an antenna to determine the effects of heavy icing on VSWR.

"It took several days of spraying a fine mist of water over the XXL radomes to create the icing conditions as they might exist in the real world," the company wrote. "The result of the test on the Shively XXL Radome was that heavy ice has a minimal effect on VSWR."

For information about Shively Labs call the company in Maine at (888) SHIVELY or visit www.shively.com.



New Eimac Power Tetrode for FM

Eimac is promoting its new ceramic/metal power tetrode, the 4CX20,000E, for use as a final power amplifier in FM broadcast transmitters.

It features an internal mechanical structure that the company says results in high RF operating efficiency and high power gain. Low RF losses structure permit operation at ratings up to 110 MHz.

"The 4CX20,000E provides up to 20 dB gain in FM broadcast service with over 35 kW output, and has been tested at over 40 kW output," said Reid Brandon, Eimac applications engineer. "The anode is rated for 20 kW of dissipation with forced-air cooling and incorporates a new highly efficient compact cooler utilizing our patented ripple-fin design."

Eimac is a division of CPI Wireless Solutions, a producer of IOT's for television broadcasting, as well as triodes, tetrodes and Pentodes for radio transmission, industrial heating, semiconductor wafer processing, radar, medical and scientific applications.

For information contact the company in California at (650) 594-4004 or visit www.eimac.com.

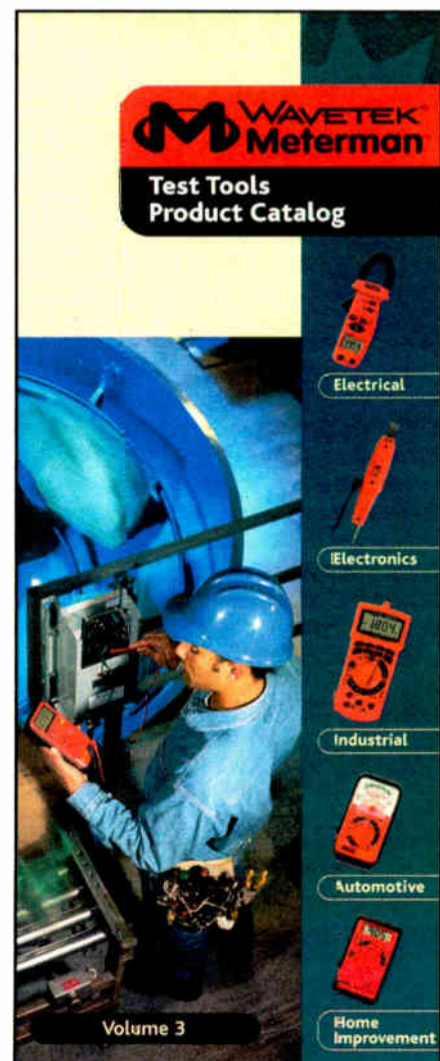


New Catalog From Wavetek Meterman

Wavetek Meterman Test Tools is out with an updated catalog of its test tools and accessories for the design, evaluation, installation, production and service of electronic and electrical equipment and systems.

The catalog includes the new DM73B pocket-sized digital multimeter, IR610 non-contact infrared thermometer and LM631 industrial light meter.

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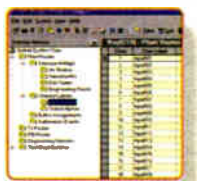
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1925

► Continued from page 20

precision panel meters, portable meters and tube testers.

And for only \$2.50, you could get your soldering iron: a Jiffy Blow Torch from the Apex Stamping Co. so you could get "the same professional connections as the highest skilled Radio Engineer." The Jiffy lit instantaneously was "self blowing" and burned "blue hot." It was "absolutely safe and cannot explode."

Carter Radio Co. manufactured various products including familiar 1/4-inch jacks called Tu-Way Plugs and One-Way Plugs. Tu-Way plugs were designed for more than one headset at a time and sold

for \$1. The One-Way plug was "used by leading loudspeaker manufacturers" and was only 50 cents.

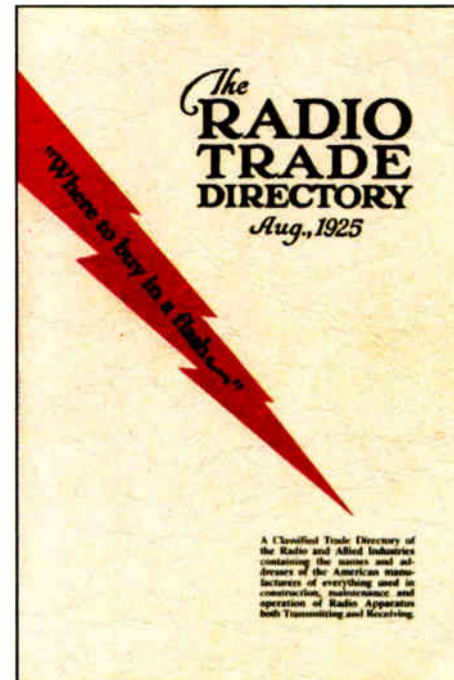
rheostats, potentiometers and loop antennas.

Every radio was housed in a hand-

Thousands of companies emerged to supply the loop antennas, dials, cabinets, resistors, rectifiers, tubes and anything else the broadcast professional might need.

The Imp battery switch made the "On or Off" connection compact and sturdy. You could also buy Vernier control

some, wooden cabinet. Knickerbocker Case Co. of Chicago sold cases bound with artificial leather for portable radios.



Perkins-Campbell Co. of Cincinnati sold cases in imitation or genuine mahogany.

For living room sets, Associated Furniture Manufacturers sold 50 types of cabinets for radio dealers. Other companies, such as the Lester Talking Machine Co. and the Specialty Display Case Co. built cases to order for the customer or dealer.

Just as every radio needed a cabinet, every radio needed a faceplate and knobs. Litho-Etching Corp. sold panels, dials and nameplates, along with Radio Panels and Parts, the Formica Insulation Co., Calvert Specialty, and General Etching and Manufacturing.

Complete sets

Karas Electric Co., Mydar Radio Co. and Jewett Radio and Phonograph provided "micrometric" dials made out of Bakelite to tune accurately to the thousandth of an inch (picture the dials on an Atwater Kent radio). These sold for \$3.50.

Complete radio sets were available through the directory. Amber Manufacturing featured the Morvodyne, the set with the "Fil-a-meter." This set could sell on its own "to a public who know the difference between a bad and good radio."

Anylite Electric sold King Cole receivers, list price \$80. This four-tube receiver was "unexcelled by even the best five and six-tube sets." Eagle Radio sold five-tube neutrodyne tabletop receivers, which were handled "only by reputable dealers."

And for only \$13.50, the "Blue Bird," a one-tube set "in a genuine cedar or mahogany finished cabinet" built by Automatic Radio Manufacturing company would "actually do what others claim."

The William Murdock Co. sold a five-tube neutrodyne for \$100, with a big loudspeaker horn mounted right on top. All of the tabletop radios pretty much looked alike: a big, dark box with four or five dials and a meter on the front.

As mentioned, they all looked like the surviving Atwater Kents you see in antique stores and museums.

Numerous radio kits were available for dealers who didn't sell just finished sets.

Telos Radio sold "the kit that experienced fans want." Telos — motto: "That the world may hear the world" — provided kits for \$60 that made "three stages of tuned RF amplification entirely practical!" Cheaper receivers, sold by William Rosenbloom for \$10 — "the best bet in a

See 1925, page 31 ►

Enter to win one of 26 great prizes in Radio World's reader appreciation contest giveaway!

Dear *Radio World* Reader: Last year, many of the greatest names in our industry teamed up with *Radio World* for a year-long sweepstakes extravaganza that resulted in almost \$50,000 in prizes given away. Due to the overwhelming response from you, we've decided to do it all again in 2002 as a way of showing our appreciation to our loyal readers.

Throughout 2002, *Radio World* will conduct 26 random drawings. Prizes and winners will be announced in every issue of *Radio World*. **That's 26 chances to win!**

To enter the contest you need to complete these three easy steps:

1. Go to our Web site: www.rwonline.com
2. Click the Readers' Choice icon on our home page.
3. Follow the instructions and fill out the electronic entry form — that's it, you're done!



This is your chance to participate in our Readers' Choice program and win great prizes from these fine *Radio World* supporters:



Contest Rules: To enter the drawing, simply register online at www.rwonline.com/sweeps. 26 drawings will be held throughout the year. Contest registration expires Dec. 4, 2002. Final contest prize announcement on Jan. 1, 2003. One prize per winner. All contestants MUST reside in the United States and have a valid mailing address. Winners should receive prizes within 30 days of notification; however, actual delivery time may vary and is not guaranteed by IMAS Publishing. Federal, state and local tax laws may apply to prizes and are the sole responsibility of the winner. Employees and affiliates of IMAS Publishing are not eligible.

1925

Continued from page 30
superhet" — claimed that its set equaled the \$200 receiver.

Antennas were necessary for the radios. Loop antennas were all the rage (they were required for those old AM receivers) and were available from numerous suppliers.

Mack Co. sold a "spring aerial," which would not "corrode, tarnish or break." Radio Units Inc. offered the "Duo-Spiral Folding Loop" which was "handsomely finished in silver and mahogany." The duo-spiral folded readily and could be used anywhere.

124 THE RADIO TRADE DIRECTORY

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Radio technicians and early broadcast engineers used the directory as their source book for parts and information. It's hard to picture our jobs without catalogs and the Internet; but in 1925, the Radio Trade Directory was the book.

By the way, the directory listed no phone numbers. If you needed information, you had to write a letter. Remember those?

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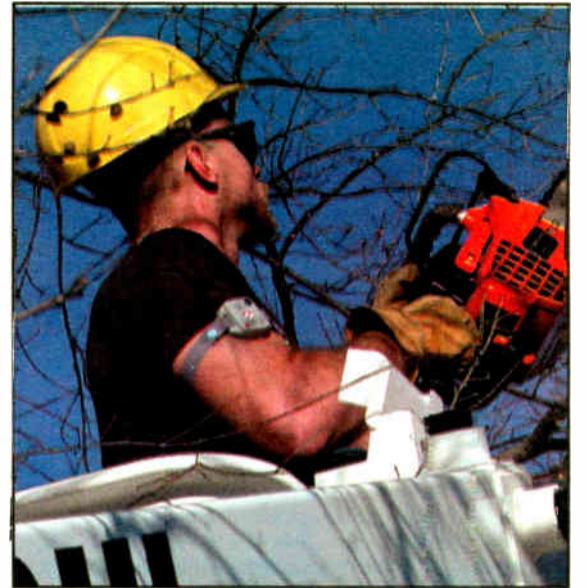
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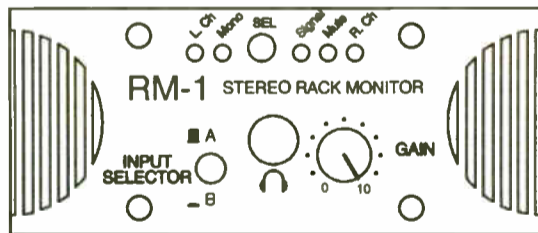
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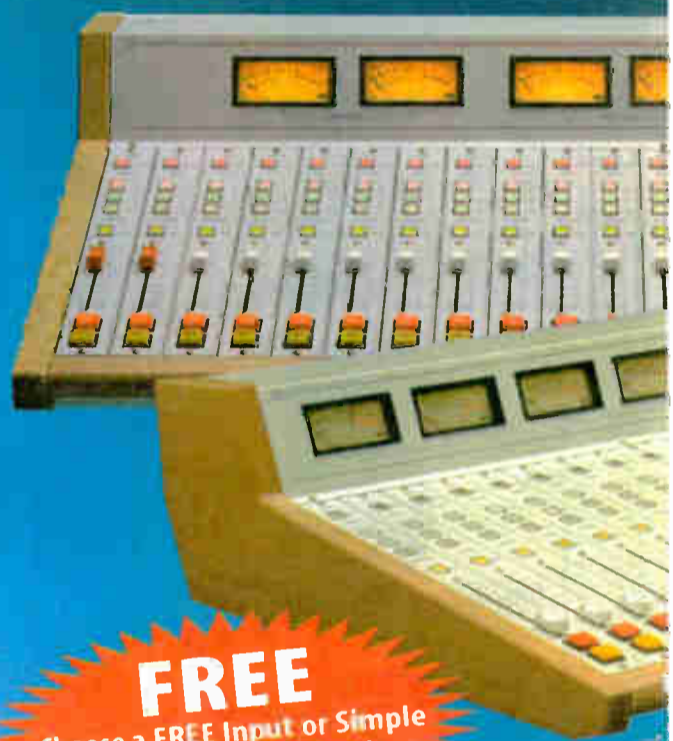
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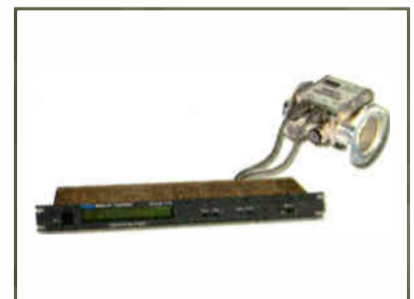


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CRS Debates Radio and Label Links

by Bob Millard

The country radio industry recently gathered in Nashville, Tenn., for the 33rd annual Country Radio Seminar. Lower attendance, fewer exhibitors and seemingly intractable differences between the needs of broadcasters, record companies and song publishers marked the event, organized by Country Radio Broadcasters Inc. at the Nashville Convention Center.

Larry Wilson, who would step down as CEO of Citadel Communications Corp. not long after the show, delivered the CRS-33 keynote address. He suggested that in the post-Sept. 11 world, successful

stations will take more chances with programming and keep shows live and local.

"I just think that we've got to be in show business and keep it exciting and new for people by not playing the same songs over and over," Wilson said. "And you've got to be in touch with your listeners; that's who you serve."

Declining share

A total of 2,106 attendees registered for this year's CRS, down about 13 percent from last year. Trade show vendors occupied about 12 percent less floor space compared to the previous year, according to Paul Allen, CRB executive director.



Jamie O'Neal, Willie Nelson and Mark Wills performed at a CRS luncheon hosted by ASCAP and Mercury Records. Front, from left: Nelson; Luke Lewis, Mercury Records president; Connie Bradley, ASCAP senior vice president; Lee Ann Womack; Ed Salamon, CRB president. Back, from left: Paul Allen, CRB executive director; Wills; Herky Williams, assistant vice president Creative Services, ASCAP Membership Group.



Larry Wilson was a keynote speaker at the CRS, prior to stepping down as Citadel CEO.

Allen attributed the decline to "the effects of the recession and also the fallout from Sept. 11 ... but to be down only 13 percent, I feel very fortunate."

The country broadcasters arrived at the annual trade conclave in an ironic position. Although country continues to be the most prevalent format with more than 20 percent of commercial stations, adult contemporary pulls the larger share of listeners at 11.4 percent compared to country's 10.8 percent, according to BIA Financial Network Inc.

Moreover, Allen cites a recent Interep Marketing Group report that found

See COUNTRY, page 36 ▶

NEWS ANALYSIS

AFTRA Works To Rule Out Noncompetes

Broadcasters Are in a State-by-State Fight to Keep 'Noncompete' Clauses in Broadcast Employment Contracts

by Frank R. Montero

Employers have long used employment agreements as a means to retain radio station talent. Such agreements may cover many aspects of the employer-employee relationship including salary, benefits, promotion and termination of employment.

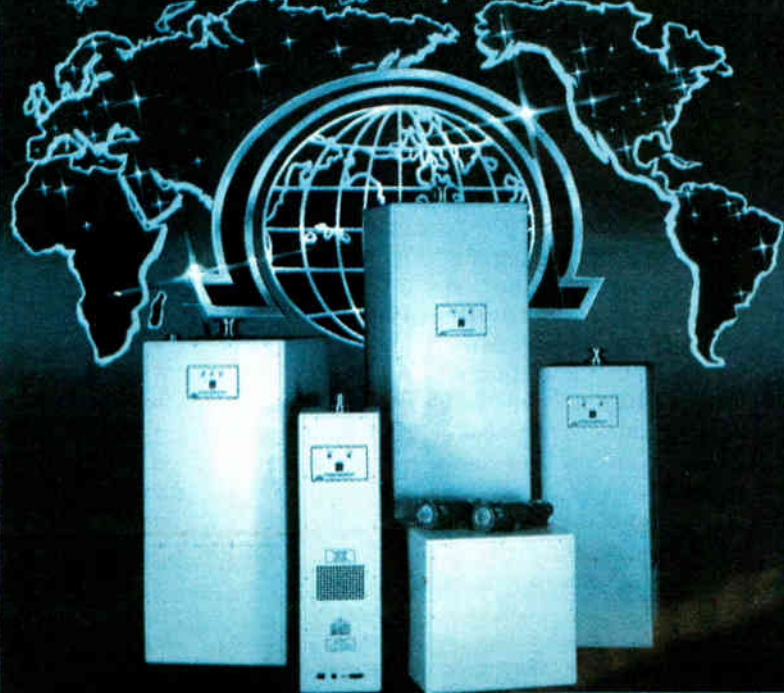
For a radio manager or owner, one of the most important provisions in a broadcast employment contract is the noncompete clause. "Noncompetes," as they are known, prohibit employees from working for a competing station for a predetermined amount of time after the employment relationship ends, sometimes years after talent leaves a station.

However, many employees claim that such provisions in their employment agreements are overreaching and essentially deprive their ability to seek

See MONTERO, page 38 ▶

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Country

► Continued from page 35

country radio declined from a 7.5 share in the 2000 fall Arbitron ratings to a 6.8 share in 2001 fall ratings. The "books" are based on the 12-plus, 6 a.m. to midnight, Monday through Sunday demographic.

"Our audience share hasn't been that low in the last 12 years," Allen said.

Country's share dipped sharply in the ratings following the Sept. 11 attacks, as listeners from all music formats switched to news.

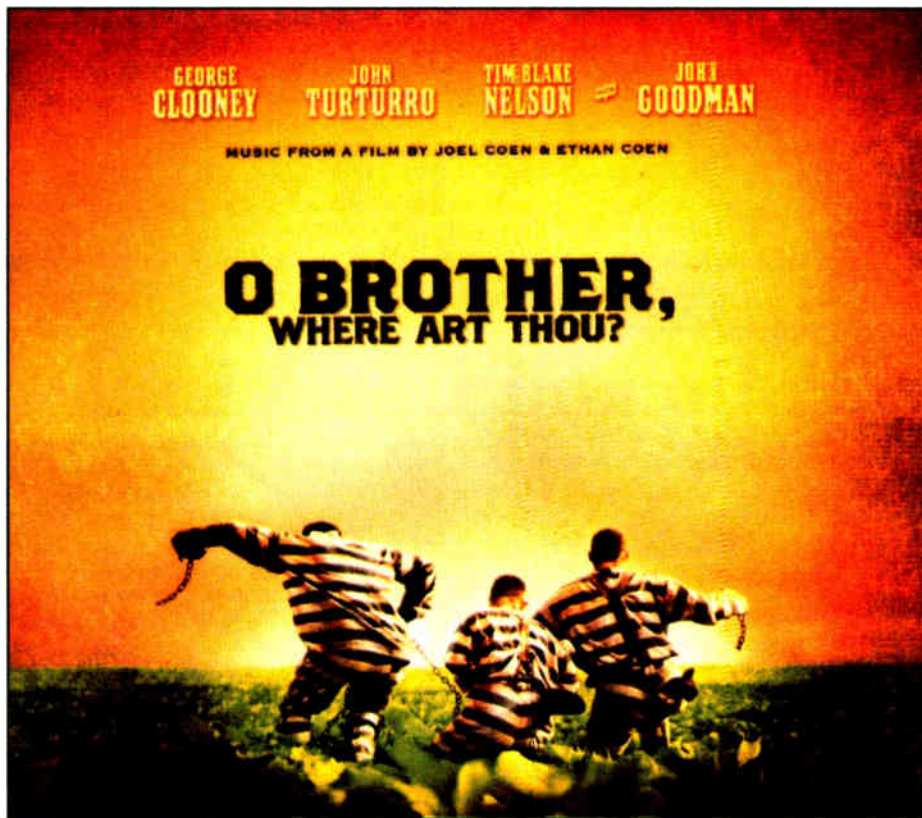
One example was the Cincinnati market, where Infinity's country WUBE(FM)'s Arbitron share of 12-plus listeners dropped from a summer share of 5.9 to a fall book share of 4.9 in the 2001. In Atlanta, the ABC country station, WKHX(FM), lost ground from a summer share of 5.5 to 4.8 in the fall book.

Across the nation, country broadcasters responded to the tragedy by increasing patriotic music and adding patriotic-themed promotions.

Waving the flag

CRS-33 was heavy with country radio-specific educational sessions.

Among the most lively and best attended was "America at War: Country in Crisis," the only session dealing directly with post-Sept. 11 programming trends, though the theme popped up everywhere. Recommendations ran from adding patriotic content to considering expanding news coverage.



'O Brother,' which sold 5 million copies with no radio airplay and swept this year's Grammy Awards, was a hot topic at the CRS.

segment: Do you target the long-time listener who seeks traditional country music but who is aging out of the advertisers' target group, or do you program younger, hybrid performers who have crossover appeal?

If broadcasters were stumped by what they called the "O Brother" phenomenon, they were even more perplexed about when they should stop playing patriotic

change that the radio industry can make to improve listenership among both country's 50-plus core audience and the advertisers' target 18-49 demographic groups.

"You have one of the best core audiences, but the vehicle is not delivering," DiVall said.

The 50-plus core country audience is no longer the most sought-after group, especially in the major markets, according to Allen, and record companies need to attract a wider audience.

This assertion was the No. 1 underlying theme as radio and record companies alike whispered throughout the CRS that the symbiotic relationship between the two was in the midst of a sea change.

More targeted

"Radio now is very different than it was five years ago, before consolidation," Allen said. "Rather than being a genuinely mass-appeal format, the country audience is now targeted to a specific demographic in each community. In almost every major market, the (dominant) country station is owned by a group.

"They define their sister stations in that cluster to reach the demographic they are looking for. Quite often, what you are seeing in many markets is that country radio is now targeting the 18- to 34-year-old female because she is very attractive to advertisers," said Allen.

"(Until consolidation) generally it was the 25- to 54-year-old, male and female; it was a broader and much less-defined market that country radio was appealing to," he said.

Country stations also are playing hits longer, going to a 24-week "hit life" on singles. Capitol Records-Nashville President/Chief Executive Officer Mike Dungan said in the "Nashville Incorrect" session that the divide between radio and country record companies' basic needs becomes wider and less amenable to compromise than ever.

"I need a 12- or 13-week cycle and I need you to back-announce who the artist is because the way it is it takes so long to get any kind of audience awareness of new product and new artists," Dungan said.

Record companies and radio "may have two different objectives. But we still need

each other," he said.

The cluster management approach may be changing that age-old truism forever, Allen said. Successful country record companies will be those who find alternative paths to expose consumers to their product, because radio is never going back to former patterns; consolidation and cluster programming reflect narrower, bottom line-oriented priorities.

"Bear in mind: Country radio's business is not to sell records, but to lease back audiences to advertisers," Allen said.

"Say a company has five or six stations in a market and they own 20 to 30 percent of the audience: Odds are, if that 18-34 female gets tired of country, she's going to punch the button, but odds are, she's going to punch into one of their other stations."

Music

CRS attendees enjoyed several performances by country stars new and old during CRS-33.

"The New Faces" show, a traditional CRS highlight, featured Rascal Flatts, Carolyn Dawn Johnson, Blake Shelton, Cyndi Thomson and Darryl Worley.

Toby Keith, the Country Music Association 2001 Male Vocalist of the Year ("How Do You Like Me Now?!") topped the "Superfaces" show.

The luncheon presented performances by Mark Wills, newcomer Jamie O'Neil and Country Music Hall of Famer Willie Nelson.

Also on tap: performances by Shannon Lawson and Lee Ann Womack. Country Music Association Female Vocalist winners recognized by the CMA since its founding 35 years ago were the focus of a Saturday luncheon tribute.

A surprise performance by past winners Lynn Anderson, Martina McBride, Trisha Yearwood and Tanya Tucker capped the CMA event.

Inducted into CRB's country DJ Hall of Fame were veterans Lee Arnold, a 54-year east coast major-market veteran and host of Westwood One-syndicated "Lee Arnold on a Country Road" program (1980-1991); and J.D. Cannon, a prominent Midwest DJ identified since 1979 with WFMS(FM) in Indianapolis, where he has led the station to market dominance for the past 15 years.

Also joining the ranks of CRB's DJ Hall of Fame were Billy Cole, one of the most peripatetic DJs east of the Mississippi River, whose "Coast to Coast and Border to Border" early morning show at clear-channel station WHO(AM) in Des Moines, Iowa, was a legendary truckers' favorite nationwide, and Joe Hoppel, who for 47 years was the award-winning morning man at WCMS(FM) in Hampton Roads, Va.

Posthumously, CRB inducted Buck Wayne, who worked in every aspect of country radio and whose early promotion of a rookie named Elvis Presley brought prominence to both.

In its third year, the new Country Radio Hall of Fame inducted Jack Cresse, the late Oklahoma broadcaster whose direction at KVOO(AM-FM) in Tulsa, Okla., brought the station to award-winning national prominence, and Doug Mayes, whose influential 32-year career included radio and television stations in Nashville and Charlotte, N.C., and a long association with WSM(FM)'s "Grand Ole Opry" radio show.

Bob Millard is a reporter and author of "Country Music: 75 Years of America's Favorite Music." Contact him via e-mail to bmillard51@juno.com.



Lorianne Crook and Charlie Chase introduced headliner Toby Keith at the CRS 'Superfaces' show. From left: Country Radio Broadcasters President Ed Salamon; United Stations' Vice President of Affiliate Relations Rob Pierce; Charlie Chase; Toby Keith; Lorianne Crook; United Stations President and CEO Nick Verbitsky and Executive Vice President Andy Denmark.

"Nashville Incorrect" was the title of the annual face-off that pits radio against the record industry.

Panelist and Nashville song publisher Charlie Monk observed that the traditional country soundtrack to the movie "O Brother, Where Art Thou?" sold 5 million copies and dominated the recent Grammy Awards for country music, virtually without radio exposure.

"But who wants to get up and turn on their radio and hear 'Oh, Death' first thing in the morning?" asked Monk, referring to the Ralph Stanley lament from the soundtrack that won the Best Country Song Grammy award.

Monk received nothing but embarrassed grins and groans from the radio panelists, but in essence, he had defined a conundrum that plagues the country radio

songs in reaction to the Sept. 11 terrorist attacks.

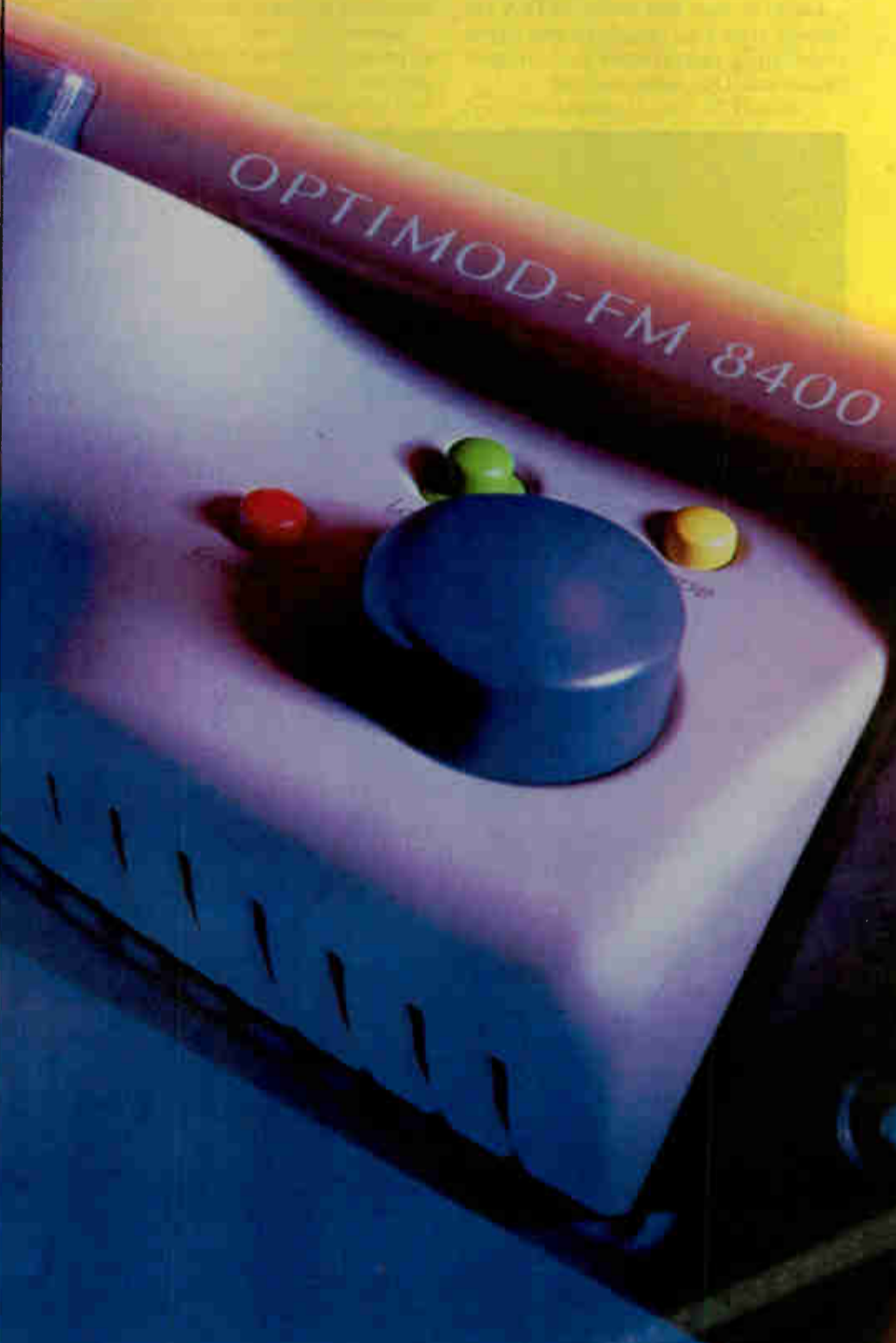
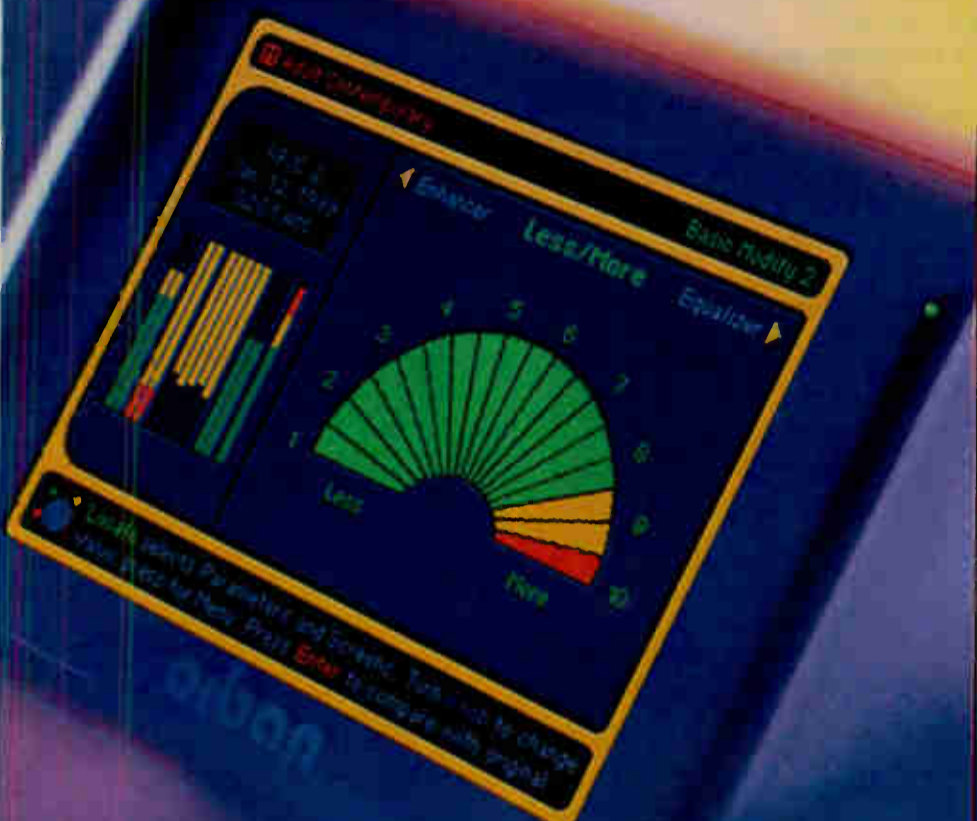
Current country radio listener research from Edison Media Research by political pollsters Alan Secrest and Linda DiVall suggests listeners still want to hear patriotic music.

"There is no doubt in the 'voters' minds in these samples: They are saying 76 percent to 19 percent that this music has a healing role," DiVall said. "I think the challenge for your industry is going to be exactly when is this teeter-totter going to tip ... when that switch is going to occur."

One of the Edison research findings is that 40 percent of country radio's core listeners reported their biggest gripe about country music is country radio.

DiVall and Secrest interpreted this finding as an indication of the potential

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Montero

► Continued from page 35

employment in the market if they lose their job. Some claim that this puts artists at the mercy of their employers and can lead to abuses by station owners.

This is the position of the American Federation of Television and Radio Artists. AFTRA has launched a campaign at the state level to ban noncompete clauses from broadcaster employment contracts for both on-air and off-air employees.

For more than two years, AFTRA has lobbied state legislatures to enact laws prohibiting broadcaster noncompete clauses and it has made headway.

Currently Maine, Massachusetts and

Illinois outlaw the noncompete clauses.

Recently Missouri introduced a bill to ban the noncompetes; this year a similar bill was passed by the Arizona Senate. As of mid-March, the bill was in debate in the Arizona House.

In response to the introduction of the Missouri bill, Elton White, executive director of the AFTRA Kansas City, Mo. chapter said, "This is a matter of simple fairness. We see noncompetes imposed on both on-air and off-air employees and they force these broadcast employees to either accept salaries lower than what they could be offered by competing stations, or move out of their home states, or leave their chosen professions altogether."

Station owners see noncompete clauses as protection against predatory competitors who may steal away that talent, as well as the employee's audience or clients.

After all, owners will tell you a station invests quite a bit of money and goodwill in developing a personality's audience and popularity. Employers also have an interest in the intellectual property developed through the station's show or on-air routines.

Other markets

The ban might also apply to employment at stations outside the market that, nonetheless, compete with the employee's former station.

A noncompete might, for instance, ban syndication of the former employee's show from another community into the original station's market.

The most common example of this concern involves disk jockeys who use their talent to develop a loyal following and listenership for a station.

And these concerns also apply to a star on your sales staff.

In its push for the enactment of such laws, AFTRA stated that "in an industry where popularity is crucial, the length of time a broadcaster must 'sit out' a non-compete can be devastating to a career.

"Further, with a limited number of jobs available and with competing stations in the market usually having similar non-compete clauses as boilerplate language in their contracts, a broadcaster is often left with very few choices for the future," AFTRA stated.

Needless to say, there are those who disagree with this position. Some claim that the laws only help well-paid TV news anchors. Yet others say that it is an unnecessary intrusion by the government into private contractual relationships.

In particular, some state broadcaster associations have taken a firm position against the proposed bills.

In the summer of 2000, the New Jersey Broadcasters Association claimed victory when the state assembly pulled a proposed bill that would have banned noncompetes in broadcasting from the legislative calendar.

Had it been enacted, the New Jersey bill would have made noncompete clauses illegal in broadcasting contracts statewide. NJBA conducted a major campaign to deny the votes to the bill's sponsor.

The NJBA did this by sending a series of faxes detailing why legislators should vote against the bill and why the bill was bad business for New Jersey.

In a sign of how contentious the issue can be, in July 2001, Illinois' Gov. George Ryan vetoed a law that would have voided noncompete clauses from on-air talent contracts. The law would have allowed on-air personalities to work for another station at the end of their contracts, regardless of whether the contract included a noncompete clause.

Confrontation

However last November, the Illinois legislature voted to override the governor's veto and in January, the Illinois Broadcast Industry Free Market Act went into effect.

The National Association of Broadcasters has been silent on the fight by state broadcaster associations to keep noncompetes in broadcast employment contracts.

It is not certain where the AFTRA lobbying efforts will lead or how it will affect the relationships between station owners and their employees. However, the battle lines have been drawn and we can expect AFTRA to continue its efforts at the state level.

In truth, these noncompete clauses will only involve a relatively small percentage of station personnel. However, that small percentage frequently includes the more valuable and talented employees at a station.

These are precisely the individuals whom owners want to keep from the competition. This is no small matter.

Regardless, the battles aren't over and we can expect to see continued confrontations as AFTRA's efforts continue in the various state legislatures nationwide.

Frank R. Montero is a communications attorney with the Washington office of Shaw Pittman LLP. He is former director of the FCC's Office of Communications Business Opportunities and co-chair of the Federal Communications Bar Association's Transactional Practice Committee. Contact him at (202) 663-8936 or via e-mail to frank.montero@shawpittman.com.

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Industry Changes



Radio World welcomes information about your career or personnel changes, particularly from radio engineers. Please see contact info at the end of this article.

The FCC has brought on **Edmond Thomas** as the new chief of the Office of Engineering and Technology.

Kent Randles moved from assistant DOE at **Infinity Broadcasting-Portland, Ore.**, to chief engineer at **Rose City Radio Corp.'s KXL(AM)/KXJM(FM)**, also in Portland.

George Beasley, chairman/CEO of the **Beasley Broadcast Group**, was elected chairman of alma mater's **Appalachian State University** foundation board.

Music producer **Bil VornDick** was elected chairman of the **Audio Engineering Society's** Nashville chapter.

The **Conclave Learning Conference** added radio vets **Michael Fisher** and **Laura Gonzo** to its board.

Steve Candullo was appointed executive VP of **Metro Networks/Shadow Broadcast Services**, subsidiary of **Westwood One**.

Oink Ink Radio hired ad writer-producer **Michael LeFevre** as executive producer at its office in Santa Monica, Calif.

Christian producer **FamilyNet** welcomed **Anita Vanetti** as a voice on its "At A Glance" series.

Clear Channel Radio shuffled positions as it named **Karen Theobald** VP of group sales for the Washington region, while **Katey Byrne** became VP of group sales for the Southeast. **Lee Clear** became the regional VP for Missouri, Kansas and part of Illinois. **John Martin** is the new VP/GM of the new Radio Interactive team.

Chuck and Debbie Johnson's "Johnson and Johnson" morning show replaces the retiring "Patti and Dollar Bill" show on Birmingham, Ala., radio station **WZZK**.

The Johnsons were named the **Country Music Association's** **Broadcast Personalities of the Year** in 1998.

Arbitron brought **Sarah Schupback** on as a training specialist for **Advertiser Marketing Services**.

Consultant **Tom Watson** relaunched **A.C.C. Consulting & Marketing International**, which specializes in 25-54 formats.

Andy Rainey was promoted to senior VP for research at the **RAB**.

French networking solutions company **Digigram** hired the trilingual **Frank Seidel** as communications manager.

Jan Wintersberg becomes managing director of international operations for **ClearOne**, formerly **Gentner Communications**.

Broadcast Electronics named **Noel Nishi** director of business development.

Gary Gross was promoted to presi-

dent of **BMG Music Production U.S.**

ChainCast Networks picked **Jeff Mandelbaum** as president of software growth services.

Jay Adrick is the new VP of strategic business development at **Harris Corp.**, which also promoted **Sandy Berenics** to national manager and **Brian McConnell** to Western regional manager for the company's Broadcast Division's radio and TV systems sales group.

Pam Leffler was promoted to sales specialist for the **Harris Broadcast Center** sales center. **Randall Murphy** joined the Broadcast Communications Division as the **Harris Broadcast Center** manager. **Ron Lane** is now national accounts manager, radio and systems for corporate clients.



Ron Lane



Frank Grundstein

Frank Grundstein joined **Radio Systems Inc.** as sales manager.

Criss Onan is now a broadcast equipment sales manager for **Technet Systems Group**.

Mackie Designshired Nigel Toates as director of sales for the broadcast market.

The new director of worldwide sales for **Orban/CRL Systems Inc.** is **Luis Endara Jr.**

Katz Marketing Dimensions appointed **Pamela Godfrey** to VP/N.Y. sales manager. **Maggie Mei** was promoted to promotions coordinator.

American Tower named **Bradley Singer** as CFO and treasurer, and **Joseph Winn** and **J. Michael Gearon, Jr.** were named vice chairmen of the corporation.

Dave Christenson becomes Western U.S. regional audio manager for the pro audio division of **Sony Electronics' Broadcast and Professional Co.**

Manufacturer rep firm **MHR Inc.'s** newest partner is **Gary Boskiacki**.

Jerry Hill leaves his position as VP of sales at **RF Specialties** to form **Earmark Corp.**, which will provide tech support for radio staffs and music production libraries and perform forensic digital audio restoration for courts.



LBA Technology honored its Mexican dealer, **DIRSA**, for 10 years of partnership.

LBA Technology honored its Mexican dealer, **DIRSA**, for 10 years of partnership.

Streaming21 appointed **David Silver**



Dave Silver



Mark Graham

to the post of president/CEO.

Greg Langston is now the president of **Dielectric**.

Crown International named **Mark Graham** as its new VP of marketing.

Klotz Digital Australia received a

boost with the addition of Technical Sales Manager **David Spargo**.

Sirius Satellite Radio President/CEO **Joseph Clayton** was appointed to the board of governors of the **Electronic Industries Alliance** and the board of directors of the **Consumer Electronics Association**.

XM Satellite Radio promoted executives who made contributions to its launch success. **Stephen Cook**, **Steven Gavenas** and **Dr. Stellios Patsiokas** were made executive vice presidents of the company.

Companies with news of personnel changes should e-mail information and high-resolution photos to radioworld@imaspub.com.

Radio Numbers Looking Up

Radio sales officials are expecting better months ahead.

A 13-month spell of negative radio revenue reports was broken in January, when U.S. radio sales bumped up 1 percent when compared to the same month last year. It was the first positive radio revenue report since November 2000.

Local sales for January increased 1 percent while national sales, which were hit hardest in 2001, rebounded with a 2-percent increase.

The Radio Advertising Bureau released the revenue report the same week that the Federal Reserve Chairman Alan Greenspan observed that the economy showed "encouraging signs of strengthening," amid industry analysts' predictions that radio could see revenue growth in the range of 4-8 percent by year's end.

Radio Advertising Bureau President and CEO **Gary Fries** said that looking ahead to February, the revenue numbers would reflect the lack of television advertising that month due to the winter Olympics. Traditionally radio enjoys an uptick in sales as the television industry's spending increases during the all-important February "sweeps month."

This year's winter sweeps month was essentially overwhelmed with the advent of the winter Olympics, so **Fries**, as well as many other analysts, believe February might be down slightly. But he was optimistic about the months to come.

"Following (the Olympics), all indicators point to ongoing sustained growth as the year progresses," said **Fries**.

January is also the first month to reflect new revenue reporting standards that incorporate a non-traditional revenue category.

Stations in 140 markets report revenue each month to **Miller, Kaplan, Arase & Co.** There had been complaints that some markets allowed stations to pad their reports with non-traditional revenue entered as traditional sources, which some felt inflated revenue reports unfairly.

Beginning with the January 2002 report, **Miller Kaplan** now offers three categories to enable radio revenue report registration: local spot, national spot and network/NTR/non-spot/other.

George Nadel Rivin, a **Miller Kaplan** partner, said the standards, which were developed under auspices of the **RAB**, have been adopted to "create uniformity in cross-market analysis."

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Golden Mike Honors Hughes, Liggins

The Broadcasters' Foundation and its members, friends and honored guests gathered at Plaza Hotel in New York City Feb. 25.

The occasion was the annual Golden Mic Award gala fundraising dinner. This year, the foundation recognized Radio One Inc. and its founder and Chairperson Catherine Liggins Hughes and President Alfred C. Liggins.

The Golden Mic Award recognizes extraordinary contributions to the radio and television industries. Past radio honorees include Lowry Mays, the Mays family and Clear Channel Communications.

Edward F. McLaughlin, chairman of the Broadcasters' Foundation, explained that Radio One's spirit of family and community service are reasons that the group chose it for the Golden Mic honor.

Champion

"The Cathy Hughes Radio One story is one of incredible personal growth, dedication, commitment, talent, leadership, entrepreneurial spirit, service to the community and values. Everything about this remarkable woman, her son Alfred C. Liggins III and Radio One makes us incredibly proud to present this family with the 2002 Golden Mic Award," said McLaughlin.

The nonprofit Broadcasters' Foundation is a member-supported financial safety net for radio and television professionals across the country in times of personal or family crisis. The organization has been in existence since 1942.

"The foundation provides anonymous financial grants to those who, through no fault of their own, are in acute need due to critical illness, advanced age, death of a spouse, an accident or other serious misfortune," said David Mleczo, Broadcasters' Foundation spokesman. "It is the *only* organization doing this work in the broadcasting industry," he said.

For more information please contact David Mleczo in Connecticut at (203) 862-8577 or via e-mail to dmleczo@broadcastersfoundation.org.

— Laura Dely



At the Broadcasters' Foundation Golden Mike Award Dinner, From Left: Gordon Hastings, Lynn Hastings, Jeff Majors, Cathy Hughes, Alfred C. Liggins, Patricia McLaughlin and Edward F. McLaughlin

BIAfn: Clear Channel Is Tops

As industry analysts begin to predict that radio revenues will increase in the range of 5 to 8 percent by year's end, BIA Financial Network Inc. said its current projected increase of 3.7 percent for 2001 likely is conservative.

Mark Fratrick, BIAfn's vice president and resident economist, said he bases his current estimate on survey results that came back in January and February.

"The economy is now picking up much faster than we thought it would at the beginning of the year — it's accelerating so fast in the past 3-4 weeks that even Fed Chairman Greenspan noted it — that it is likely that when I revisit this estimate next quarter, radio will exceed it," Fratrick said in March.

BIAfn updates its survey of Arbitron-rated markets after each ratings period.

Strong position

Fratrick predicts radio will continue to realize additional revenue benefits from consolidation that a stronger economic environment will magnify.

"If you own more stations with a variety of formats, you have a wider reach, so radio groups can approach a client with multiple options to help them hit their target demos. Even if cluster groups don't do joint selling, that they have one management improves radio's position in the media market place. That's what went on in late '90s as we began to implement consolidation.

"Now we'll continue to see this improve radio's percentage of the major-media advertising pie. I think radio, which now holds about 12 percent, could reach 14 percent this year," Fratrick said.

BIAfn estimates that radio revenue dipped 8 percent in 2001 in comparison to the previous year.

"It was a strange year, down even before Sept. 11, so the industry had to stay its costs and now it is well-positioned for growth," said Fratrick.

No group is better positioned for the improvement in the economy than Clear Channel Communications Corp., which tops both the "Top Groups" and "Top Billing Radio Stations" lists from BIAfn.

Clear Channel Communications was again the No. 1 group, with a 2001-estimated revenue of \$3.26 billion, or 27.4 percent of all radio revenue, according to BIAfn. Its nearest competitor, Viacom International Inc.'s Infinity Broadcasting Corp., earned \$2.1 billion last year, according to BIAfn's estimate, or 17.6 percent of total radio revenue.

The Winners Are ...

Who's up and who's down? Here are the top-earning stations of the past year, according to BIA Financial Network Inc.

2001 Rank	2000 Rank	Station	Format	Est. Rev. (in \$000s)	Market	Owner
1	1	KIIS(FM)	Top 40	61,300	Los Angeles	Clear Channel Comm.
2	4	WLTW(FM)	Lite AC	56,300	New York	Clear Channel Comm.
3	2	WFAN(AM)	Sports/Talk	51,300	New York	Infinity Broadcasting
4	5	WINS(AM)	News	49,700	New York	Infinity Broadcasting
5	7	KROQ(FM)	Alternative	48,700	Los Angeles	Infinity Broadcasting
6	3	WXRK(FM)	Alternative	44,200	New York	Infinity Broadcasting
7	19	KYSR(FM)	Modern AC	43,900	Los Angeles	Clear Channel Comm.
8	11	KPWR(FM)	Urban/CHR	42,400	Los Angeles	Emmis Comm.
9	6	WHTZ(FM)	CHR	41,300	New York	Clear Channel Comm.
10	17	KOST(FM)	AC	40,500	Los Angeles	Clear Channel Comm.



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2001 Top 25 Radio Groups

Here were the top-grossing radio groups last year, according to BIAfn.

2001 Rank	2000 Rank	Group Owner	Est. Rev. (in \$000s)	Stations	Markets
1	1	Clear Channel Comm.	3,256,482	1,231	190
2	2	Viacom International Inc.	2,092,050	183	41
3	3	Cox Radio Inc.	428,000	81	18
4	5	Entercom Comm. Corp.	408,075	104	19
5	4	ABC Radio Inc.	401,700	58	29
6	6	Citadel Comm. Corp.	313,360	205	41
7	8	Radio One Inc.	287,097	64	22
8	7	Emmis Comm.	258,900	21	7
9	11	Cumulus Media Inc.	253,035	243	52
10	9	Hispanic Broadcasting Corp.	251,600	55	15
11	10	Susquehanna Radio Corp.	220,900	31	9
12	12	Bonneville International Corp.	188,750	20	6
13	23	Salem Comm. Corp.	135,975	83	36
14	15	Greater Media Inc.	135,925	18	6
15	13	Spanish Broadcasting System	127,650	23	8
16	14	Jefferson-Pilot Comm.	125,250	17	5
17	16	Beasley Broadcast Group	115,650	43	11
18	17	Saga Comm. Inc.	100,075	60	11
19	18	Journal Broadcast Group Inc.	69,225	36	8
20	19	Entravision Comm.	63,950	53	23
21	26	Regent Comm. Inc.	63,625	61	13
22	20	Sandusky Radio	58,200	10	2
23	21	Inner City Broadcasting Corp.	56,975	17	8
24	24	NextMedia Group	48,725	56	11
25	29	Lotus Comm. Corp.	45,900	24	7



PRODUCT EVALUATION

Shure KSM27, a Worthy Contender

by Carl Lindemann

In radio's Golden Age, ribbon microphones defined the sound. In the half-century since, dynamic microphones have dominated broadcast booths. The current generation of broadcasters has been reared on a handful of rugged and reliable makes and models. For many, these are the "standard."

Only a small number of them have opted for condenser mics, which generally are viewed as pricey and less durable despite exceptional sound quality. These microphones have been seen as suited to the more rarified atmosphere of music recording.

Turning tide

A flood of inexpensive condenser mics may change that, however.

A few years back, Shure introduced the KSM line of studio microphones intended for studio recording in the music industry. Its latest entry, the KSM27, is designed for both studio and "live," or in-the-field, applications. As such, it can also face radio's rough-and-tumble.

The KSM27 is cost-effective at \$575 retail. It is an externally biased cardioid condenser that comes complete with rubber isolated shock mount.

Inside, the heart of the mic is a single 1-inch, gold-layered Mylar diaphragm powered by a Class A discrete transformerless preamplifier.

An integrated subsonic filter removes rumble below 17 Hz, while the grille is designed to give pop protection.

Controls include a three-position low-frequency filter to help cut the proximity effect and a 15 dB pad for dealing with extremely high volume situations. Frequency response is rated at 20-20,000 Hz.

Unlike dynamic microphones, which point at you, the side-fire KSM27 stands up in the shock mount. The controls sit in the back while the front faces you. Plugging this into a Behringer MX 602A micromixer, setting levels for this phantom-powered unit was quite different from my usual dynamic.

The output levels for condenser microphones typically are much higher than those for dynamic mics. I did not have to push the preamp on the board to get usable levels. Keeping the board at its comfort zone, combined with the KSM27's low self-noise (14 dB), made for a quiet combination.

Many studio mics pride themselves on having a flat frequency response. Although that is great for recording instruments, it can put voices in a

harsh light.

The KSM27 has a response curve tailored to vocals. Basically, there is a lift at around 3 kHz that tops out between 6 and 7 kHz. Also, the low end has a slight boost that peaks at about 50 Hz. Test recordings revealed a pleasingly warm, vibrant sound.

Gentle rolloff

Shure technicians narrowed these specs down even further for me. The cutoff starts at a much lower frequency, while the rolloff is more gentle and starts at a higher frequency. The response starts to narrow with the low-end cutoff at 18 dB per octave at 80 Hz, then continues to narrow as the low-end is rolled off more gently at 6dB per

See SHURE, page 44 ▶



The DJ Birdcall: 'Cheap-Cheap'

by Alan R. Peterson

Scrooge came to visit early this year.

And like some cheap special effect from that Patrick Swayze/Whoopi Goldberg "Ghost" flick, the old boy jumped into my skin and seems to be driving the bus right now, at least as far as my finances go.

Frugal

Having free-lanced for almost two years following my abrupt departure from Fairfax Public Access Radio/TV in July 2000, I eventually learned to adjust to my new level of frugality. Happily, I was never reduced to living off of water, saltines and whatever dust bunnies from under the dresser I could capture and cook. But I wasn't living the Trump lifestyle either.

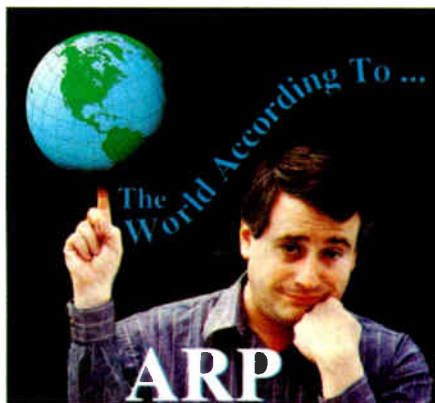
Now with my newfound full-time employment (RW, March 13), I thought for sure I would bounce back and resume my frivolous ways.

No such luck.

The extra gray hair or two I've picked up over the years might just be a signal that it's time to be a little more conservative with my spending habits. No longer can I throw obscene amounts of cash at photo gear I will use once a year, nor at stereo equipment designed to cause plate tectonic shifts in the earth's outer crust.

No, it's time to get serious, says the little Scrooge inside me, lodged comfortably

See ARP, page 44 ▶



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Economical Pro Tools Storage Solution Available

The DigiDrive FireWire 80 from Digidesign is an economical storage solution for Pro Tools systems.

Similar in appearance to the company's DigiDrive SCSI drives, the FireWire 80 drive has a larger capacity and high data transfer rates at a lower price (list \$575).

The drive provides 80 GB of storage space and supports 24 tracks per drive, with a maximum of two drives for a total track count of 48. Plug-and-play makes the FireWire 80 simple to use; no accelerator cards or terminators are required. The drive can be hot-swapped without rebooting the host computer.

The DigiDrive FireWire 80 frees up a PCI slot, which makes room for an additional Pro Tools card and provides a fast means for SCSI drive backup.

The 7200 rpm, 400 Mbps DigiDrive FireWire 80 features a QuietDrive enclosure that reduces drive noise by 20 dB.

Customer support is provided by Digidesign and the drive is certified compatible with Pro Tools on Mac OS and Windows 98/2000/XP systems.

For more information, contact Digidesign in California at (650) 731-6300 or visit www.digidesign.com.



BIAS Peak Supports Mac OS X

BIAS Inc. makes a software stereo digital audio editing and recording program that is native to Mac OS X. The Peak editing and recording program comes in the Peak LE 3 entry-level edition and the new Peak 3 for professional use.

Peak allows audio professionals to take audio from conception to final mix, CD, video, film or the Web. The series can run on earlier Mac systems, but it takes advantage of the OS X's advanced capabilities, including protected memory space for enhanced system stability; the streamlined "Aqua" user interface and CoreAudio, the audio I/O component of OS X that supports multichannel, multichannel hardware and beyond 24-bit/96-kHz resolution.

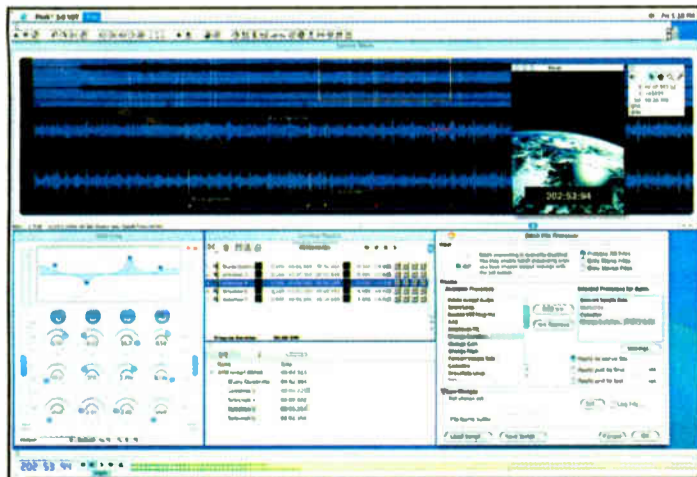
Peak 3 ships with the new BIAS Freq, a mastering-quality four-band parabolic EQ. Freq enables high-end audio equalization, with -18-dB to +18-dB gain values, 0.1- to 10-Q values, sweepable 20-Hz to 20-kHz frequency values, high- and low-cut filters, individual band bypass buttons, 24-dB stereo input/output

meters and a Carbon Event-driven interface.

Enhancements to Peak 3 include improved Sample Rate Conversion; fast onboard MP3 encoding and high-end dithering algorithms from Pow-r. BIAS Vbox SE, the VST multieffects control environment formerly bundled with Peak, is available as an integrated OS X-compatible feature.

The Peak LE 3 also has a number of enhancements. The new Cursor Palette has integrated BPM-based looping, the Contents Window is growable and markers, loops and regions can be sorted within the application. A Transport has been added with growable audio meters. Peak LE also supports VST Plug-ins.

For more information contact BIAS in California at (800) 775-2427 or visit the company Web site at www.bias-inc.com.



Cube's Quadriga Converts Archives

Quadriga from Cube Technologies is an automated "capturing" station for quality-controlled analog-to-digital conversion of sound archives to digital interim data storage systems such as DAT and CD-R, digital mass storage systems or both.

The station uses technology unique to the company's AudioCube multichannel integrated audio workstations, providing automated monitoring and logging of analog and digital audio streams for technical parameters of archival significance.

These include audio dropouts, clipping, clicks, hum, signal-to-noise ratio, azimuth/phase, analog distortion error and splice identification and analysis, among others. According to the company, Quadriga is the only system on the market that can analyze incoming audio data stream for the list of anomalies and store the error log in the header of the Broadcast WAVE file.

The captured audio data is stored in the Broadcast Wavefile Format (BWF) with related metadata and error reports. This saves time by reducing time-consuming procedures, and guarantees a high level of quality control and reduces archive transfer costs.

Real-time or faster Import modules are available for tape machine, turntable, compact cassette, CD, U-Matic, DAT and nine-pin-controllable machines.

For more information contact Cube in Ontario at (905) 469-8080 or visit www.cube-tec.com.



AMS Neve Upgrades Logic 3SC

The AMS Neve Logic 3SC is a networkable post-production workstation for high-speed editing and mixing.

It uses ESP digital signal processing technology from the company's DFC digital film console to give users 64 mix channels with dual filters, four-band EQ and dynamics, eight auxes, 16 groups, one main stereo output and the automation capabilities necessary to perform complex mixes efficiently.

The latest developments to the Logic 3 include doubling the number of busses, channels and auxes, plus adding joysticks and a surround monitoring system derived from the DFC.

The company added editing tools such as the DSP ToolBox, a set of DSP plug-ins that can be used for file interchange and signal processing, among other functions, and run on the AudioFile SC V2, equipped with the company's SAM card.


The integral AudioFile SC editor is a gateway to networking, plug-ins and future developments. The mixing system is menu-free, which lets users change any part of the mix at any time via a touch-sensitive Logicator rotary control.

The mixing surface is a mixture of familiar controls and assignable functions. The system can come with 16 physical faders, and another 16 are visible on the workstation's large TFT panel. This provides a potential of 32 visible faders for automation and mixing functions.

Dedicated controllers include the AudioFile editing controller, motorized faders and the Logicators. The controls are optimized for rapid post-production work.

For more information contact AMS Neve in New York at (212) 965-1400 or visit the company Web site at www.ams-neve.com.





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ARP

► Continued from page 41

somewhere between my duodenum and my patooy gland.

The little bugger won't even let me go out and buy a bottle of stuff to get rid of the gray.

Scrooge is now directing many of my thoughts and actions, bent on staying upon the financial path laid before me by my underemployment status. For example, why drive to that radio gig when the buses and subways can get me there cheaper?

Note Scroogie said nothing about getting me there *faster*. Truth be known, my travel time has almost doubled on my "long days" when I teach at night. What I gain in savings I lose in family time.

Still, there is wisdom in that. I can nap on the train, while it is mighty hard to do the same driving 60 mph on I-395. Someone paid to drive for a living busses me back and forth in the snow — no fender benders or skids in my little Ford Escort.

I cannot eat or drink on our transit system, but I can clap on some headphones and not worry about being pulled over by the local constables for doing so. And I can be saving up to \$80 a month.

Okay Scrooge, you win that round.

Software hog

One frill of which I have found it hard to wean myself is audio software and the computers it runs on. Love the stuff. I'd marry it if I hadn't already taken that plunge last June.

I sit up and drool like a hungry schnauzer when I price out programs like the Reaktor synthesizer system, the Unity sampler, Vegas, Pro Tools and the like. When the SAW family of products vanished a couple of months ago, I was spared the shock of having to front the bucks for the latest SAWPro version, by then in the high hundreds.

And the machines! My, my, the parade of PCs marching past me in the Sunday shopper pages and the magazines ... processors that clock so fast, they are practically up in *radar* territory.

My thoughts remained quite scrambled ... "Let's see, if I live on macaroni and cheese for eight months (with double coupons) and do the kid's braces myself with some nylon cable ties, I should have about \$2,500 by December, which I can blow on a P-IV with a Turtle Beach card and a flat monitor."

Well, wouldn't you know ol' Scrooge pops up to show me the cheaper way. First, the old buzzard puts me on the path to a used computer store not 10 miles from home. Here, as we all have seen elsewhere, a P-III 400 box — *plenty* fast for audio — can be obtained with a monitor and Windows already installed, for a fistful of beans.

With RAM cheaper than driveway gravel, that used box can be beefed up for another slice of not-very-much, thank you.

But all that lovely audio software. What about that? How can I unleash my inner beast without at least a \$600 investment in CD-ROMs and tutorials?

That answer came in an unexpected place. On a trip to our local electronics and appliance superstore, I felt compelled to visit the budget (\$9.99 and

less) software rack. There, among the horoscope generators, cheap clip art and Be-a-Bartender instruction discs, was Scrooge's vindication.

A company called Magix distributes what it calls the Crown Jewel Series. Part of that product line includes Dance Maker, an Acid-like, loop-based music creation program with 16 tracks, tons of real time effects and 1,000 samples. See Fig. 1. My investment: \$9.99.

Next to that was Audio Studio, a 16-track digital editor with all the fun stuff: time stretching, pitch shifting, reverb, gate, dynamics, three-band EQ and buckets more.

More for less

This thing does triple what the old SAW 6.4 could do a few years ago, *and it does it for 10 bucks!* No wonder IQS shuttered its doors.

Last, an MP3 maker/ripper/jukebox/playlist generator was needed to make the day complete. On the middle rack was a "lite" version of Sonic Foundry Siren Jukebox, bargain-priced at \$4.99.

If that wasn't enough to make Scrooge jump for joy, the cashier rung it up for a whopping \$1.99.

I pointed the price sticker out to her, but she said that's the way the register had it on file. I wasn't a dummy; I bought it.

The total damages: a music loop tool, a multitrack recorder and an MP3 jukebox program for about \$22. I've spent



Magix Dance Maker: Get loopy for only about 10 bucks.

more on guitar picks.

And if I didn't have three MIDI sequencing programs at home already, I could have gotten the Magix MIDI Studio for another sawbuck.

Are these products necessarily things that I would bet the station on? Could I actually depend on any of these to be the nerve center of my production room? I don't know yet, but

the goofy things work as advertised, so you never know.

You know, Scroogie, I think I'm beginning to like having you around. If I keep finding bargains like these and taking the bus and the train to work, I just might be ahead of the game by the end of tax time this month.

I just wish you'd let me dye my hair. ●

Shure

► Continued from page 41
octave starting a 115 Hz.

The low-end boost turns into more of a blast with the proximity effect. I prefer to leave the low-frequency filter flat and use the proximity effect for, well, effect. To my ears, the deep cut option on the KSM27 makes for a rather thin sound, albeit canceling the proximity effect.

If you like going this route, the more gentle roll-off option seems to be a nice compromise, especially

cast mic also has to deal with amateurs. Shure does not offer the usual broadcast solution, a foam wind screen/pop filter that mounts directly over the grille. That solution likely would compromise the microphone's frequency range in pro audio applications. Instead, the company suggests one of those Popper Stopper external screens that can be mounted to the mic boom.

Never caught on

As useful as these screens may be in the recording studio, they have never caught on with broadcasters and are not likely to anytime soon.

The KSM27 mic is designed for both studio and 'live' in-the-field applications.

when working with announcers and/or guests who do not know how to work the proximity effect for emphasis. Oddly, the switch puts the deep cut next to the flat setting. It seems that the mid option should fall between extremes. As it is, this could cause some confusion.

My one major issue with the sound of KSM27 came in handling plives. The integrated three-stage pop filter was not nearly "pop-proof."

For professionals who are mindful of proper technique, this is not a problem. But more often than not, a broad-

The A32SWS windscreen that fits the Shure 44 and 32 mics also works with the KSM27. As it turned out, the third-party foam windscreen from my Electro-Voice RE20 fit fine on the KSM27. It did not noticeably cut the high end from my voice, yet it made the microphone practically impervious to plives.

The only area where I did not give this microphone the full treatment was in the general mishandling that sometimes happens in stations.

I gave it a good shake and got the sense that it is of sturdy construction

Product Capsule:
Shure KSM27 Microphone

Thumbs Up

- ✓ Warm, clean sound
- ✓ Inexpensive, quality condenser design
- ✓ High output levels

Thumbs Down

- ✓ Prone to plives
- ✓ Odd layout of low-frequency response switch

Price \$575

For more information, contact Shure in Illinois at (847) 866-2200 or visit www.shure.com.

and is not overly delicate. I did not, however, give it the drop test that I have seen applied inadvertently and unintentionally at times. According to Shure, the KSM27 goes through the same drop tests as the SM58 to test for durability.

Holds up well

When working in an environment that is actively hostile to equipment, sticking with battle-ready dynamic mics may be right just on general principles. But this condenser should hold up well with anything short of outright abuse.

Apart from the possible need to purchase the accessory foam windscreen, the KSM27 is a fine microphone and a good value. Although it may be hard to get broadcasters to take a chance on anything other than the established "standard" dynamic studio mics, those who try this could set a new standard. ●

PRODUCT EVALUATION

Maxtor Capacity Eases Limitations

by Carl Lindemann

Maxtor's Personal Storage 3000DV external hard drive reminds me of the tremendous time and effort once spent working around computer storage limitations. As a station production director back in Windows 3.x days, I had to train the airstaff to manage carefully the 540 MB on the digital audio workstation's hard drive. We were all thrilled when I was able to upgrade the system with a 2 GB hard drive.

Bigger closet, more stuff

Even so, this "enormous" capacity was quickly filled without the regular removal of nonessential audio elements. Constant attention had to be paid to how much space was available and what could be tossed to free up more.

Because cost-effective CD burners had yet to hit the scene, produced pieces were archived on reel-to-reel as soon as they were good to go. Making tweaks later — changing the dates on a promo, for example — could force a complete redo of a spot instead of just altering an element. This was awkward and inefficient, but that was what we had to work with.

even the most involved radio production with layers and layers of elements and effects.

Aside from the technical achievement of attaining this amazing capacity, the fact that the 60 GB version evaluated here costs about \$300 makes this a cost-effective solution to studio storage.

The heart of the 3000DV is a 7,200-rpm ATA/100 hard drive with a 2 MB data buffer attached to a 1394 interface. This comes shock-mounted in a translucent case. Altogether, the package measures a mere 1-5/8 x 6 x 8-5/8 inches.

An external power supply and the 1394 cable are included. Although the drive will work on either the Mac or PC platform, it comes preformatted as a single partition in FAT32. Mac users have to reformat with the provided installation software.



stereo) clocked in at 65 seconds. Obviously, this can handle as many tracks as you care to throw at it. Incidentally, none of this comes near 1394's available bandwidth of some 400 Mbps. There is plenty left over to daisy chain additional drives — up to 63 altogether.

In practical terms, this drive is fast for production. Using the laptop, I loaded the full 16 stereo tracks in IQS SAW32 with separate audio files on the external drive. I layered them so that an additional track was added every five seconds.

Way fast

As the playback passed the dozen-track mark, the hard drive access LED on the front of the unit started to sputter. Although the drive was pretty busy with 16 stereo tracks running simultaneously, it did not lock up. Nor did I detect any dropouts or signs that this was too much to keep up. In fact, I suspect that this external addition was far faster than the 4,200 ATA/33 drive included in the laptop.

One issue I have with the 3000DV has more to do with 1394 than the unit. As it happens, 1394 support for Windows NT is nearly nonexistent. If your DAW runs under NT, finding a supported 1394

Product Capsule:
Maxtor's Personal Storage 3000DV

Thumbs Up

- ✓ Fast
- ✓ Portable
- ✓ Inexpensive

Thumbs Down

- ✓ Little NT support for 1394

Price \$300

For more information, contact Maxtor in California at (877) 692-3562 or visit www.maxtor.com.

adapter card is a challenge.

It seems that only these more recent iterations of Windows are really designed for 1394. Searching the Web, I did manage to find one 1394 card that claimed to support NT. Even so, that would require reformatting the drive under NTFS.

Unlike NT, Windows 2000 (and XP) supports both NTFS and FAT32. I had no problem swapping this drive between the FAT32-based laptop and the Windows 2000 tower with an NTFS hard drive.

Maxtor's Personal Storage 3000DV is definitely worth considering if portability and flexibility are important factors in adding storage.

If the 7,200 rpm/60 GB version isn't right, their product family simply swaps different drives into the same 1394 external case — with capacities up to 160 GB. And there is a USB 2.0 version also for fans of this interface. When choosing the model you require, it might be helpful to know that "DV" designates the 1394 products. The 60 and 80 GB versions use 7,200 rpm drives. "LE" designates the USB 2.0 drives, which use 5,400 rpm drives and come in 40 and 120 GB capacities.

In whatever flavor, it is fast, easy, and the price per MB is still hard to believe.

Using any of these external drives is a simple way of adding storage to an audio production setup.

Over the past few years, the increase in speed and size for storage — plus the incredible drop in cost — is amazing. Maxtor's 3000DV marks many of the latest developments in these products.

The Maxtor Personal Storage line comes in several flavors covering a range of sizes and hard drive speeds, and is available in 1394 (FireWire) and USB 2.0 interfaces. Using any of these external drives is a simple way of adding storage to an audio production setup.

They are handy whether used to carry files between standalone workstations, as an archive for portable production, or just to add space to a cramped computer setup.

These products hold immense amounts of audio and deliver it up fast. As the name implies, disc access in the 3000DV is designed to handle the needs of digital video editing. Even the slower 5,400 rpm units are more than enough to handle

Maxtor's 1394 PCI adapter card made the connection to the test computers. Installing the card was automatic in both a Windows ME laptop attached to a docking station with PCI slots as well as a standard PC tower running Windows 2000.

Once the card was identified properly, the external drive could be hot-swapped; systems do not have to be rebooted to identify the drive. I simply plugged it in via the supplied cable, and the OS added the appropriate drive letter. Detaching the drive required clicking on a few icons to properly disengage.

At first, I wasn't sure how the ATA/100 spec would perform when passed through the 1394 interface. While it can't compete with Ultra160 SCSI drives for raw speed, it is plenty fast for audio production.

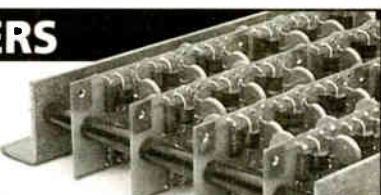
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April 10, 2002

USER REPORT

AKG Condenser Mic Makes a Change

by **Graham Bland**
Assistant Production Director
Clear Channel Nashville

NASHVILLE, Tenn. When our technical engineer at Clear Channel Nashville came in to my studio a couple of months ago and asked me to try out a new microphone, I was immediately skeptical.

If there's one thing a radio person doesn't like, it's changing microphones. I've experimented with a host of microphones over the years and they were never positive experiences.

The engineer went on to explain that he had a new condenser microphone from AKG Acoustics, the C 4500 B-BC. I told him "No way," I didn't want to deal with a condenser microphone.

After some arm-twisting, I finally let him put it in my studio for "a couple of days."

It hasn't left since.

The AKG C 4500 B-BC is a large-diaphragm (one-inch) cardioid condenser microphone designed for on-air broadcast applications. Broadcast-specific features include a front-address capsule optimized for distances of 2-3 inches, an internal pop filter and special electromagnetic screening designed to reject RF interference associated with computer equipment in the control room.

Features

Other features include an integrated 120-Hz roll-off filter and a -20 dB preattenuation pad. The microphone is encased in an all-metal housing.

After relenting to the tech engineer and allowing him to install the microphone, I went on to cut a couple of new spots. Despite my initial trepidation, I simply was blown away.

The AKG does not have the popping problems that are typically associated with condenser microphones in on-air environments, and because of the way the

capsule is tuned, the C 4500 B-BC can cut through any kind of mix.

The ability to cut clearly through a variety of mixes is important in our situation. Clear Channel Nashville comprises five very different radio stations — WSIX(FM) (country), WUBT(FM) (urban), WNRQ(FM) (rock), WRVW (FM) (CHR) and WLAC(AM) (news/talk) — the processing and music for which varies greatly from station to station.

Rock, CHR and urban are particularly challenging because the amount of activity

See AKG, page 48 ▶

USER REPORT

A-T Mic Brings Warmth To the Digital World

by **Robert Conrad**
President
WCLV(AM/FM)

CLEVELAND With the approach of digital audio broadcasting, radio stations throughout the world are finding themselves in need of equipment for the digital conversion.

Typical hardware

Digital consoles and digital workstations are the typical hardware radio professionals acquire first, but a facility's upgrades should not end there.

Beginning in 1999, WCLV(FM) in Cleveland upgraded the entire facility with state-of-the-art digital equipment.

From the outset of this project, we realized that our station's on-air and production studio microphones, purchased during the 1970s, were not going to be up to the quality of the rest of the audio chain. The right tool had to be found to meld our on-air vocal talents into this newly created digital broadcast environment.

See AUDIO-TECHNICA, page 48 ▶



Graham Bland and the AKG C 4500 B-BC



Bob Conrad and the Audio-Technica AT4047/SV

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TECH UPDATES

Neumann Releases Solution-D Mic

The Solution-D digital microphone system is a departure from the standard fare for developer Neumann, which had previously worked only with analog equipment.

The system consists of the D-01 microphone, the DMI-02 interface and a software package for a PC or Mac. Conversion from analog to digital occurs within the microphone through a patented A/D converter and allows for 130+ dB of dynamic range and low self noise via a unique gain-ranging approach.

The "operating system" of the microphone is based around the AES 42-2001 digital microphone interface standard, and is a two-way communication system between the microphone, the input device and the software.



This allows for microphone parameter adjustments from within the software for polar pattern, filters, sample rate and other functions. The system can operate as a master clock or can sync to a studio clock.

For more information contact Neumann in Connecticut at (860) 434-5220 or visit www.neumannusa.com.

AKG

► Continued from page 47

in the music mixes makes it difficult to lay down a voice track that not only comes through clearly, but still sounds good and is intelligible.

That is where the C 4500 B-BC really shone. I tried to compress the life out of the signal and not only did the microphone not sound compressed, it still had an open, transparent sound in the top end.

Unlike a lot of other condenser microphones, the AKG does not have a hard edge around the 2-3 kHz range. I could lay the voice track just on top of the music or right below and it still came through crystal clear.

Broadcast benefit

The physical design of the C 4500 B-BC proved to be of great benefit for broadcast studios.

Anybody working on air wants to talk behind a front-address microphone. Not only does the AKG afford this capability, it does so in an unobtrusive package. Announcers don't have to stare down the barrel of a foot-long piece of steel. The microphone's low-profile design allows them to see beyond it and read the copy in front of them as well as operate the controls with ease.

The real test came when I asked one of our long-time announcers, who has been using the same microphone for years, to try out the C 4500 B-BC. To say he was reluctant would be an understatement, but I finally got him to try a

couple of lines in the production studio.

He was knocked out by the transparency of the warm, airy sound that he heard, so much so that he's requested a microphone for himself. The remainder of the on-air and production staff share similar sentiments.

After a good month of putting the AKG C 4500 B-BC through its paces using a variety of processors and processing settings as well as numerous microphone preamps, there was no doubt in my mind that the microphone was a winner.

Sonically, the C 4500 B-BC sounds pristine. In one particular hard-core spot for a car dealer on our rock station, I really kicked the heck out of the processing and took off nearly 10 dB from the microphone while retaining the intelligible, open sound to which I'd become accustomed. I also ran the AKG through some subpar microphone preamps that I wouldn't even think about using on the air and it still sounded great.

When I delivered my results to Clear Channel Nashville's engineering staff, they agreed with me. We've already installed seven AKG C 4500 B-BC mics and another 17 are on the way.

WSIX was the first to go live on air with the microphone; WNRQ followed shortly thereafter. The rest will be spread out throughout the production and on-air studios here.

AKG clearly has done its homework and hit a home run with the C 4500 B-BC. This broadcast microphone will be comfortably at home in any radio station's on-air or production studios.

For more information contact AKG in Tennessee at (615) 620-3800 or visit www.akgusa.com.

Mackie Offers Compact Speaker

The Mackie HR624 is a THX-approved, 6-inch, two-way active reference monitor that provides the same accuracy as Mackie's HR824 monitor in a more compact, lightweight, lower-priced package.

It's designed to work with the Mackie HRS120 12-inch, 400-W active subwoofer system and the HR824 active 8-inch monitor in surround installations.

According to the company, the HR624 is suited to smaller facilities looking for a monitor that combines features and value.

Based on the acoustic technology of the HR824 for the same quality of clarity and responsiveness, its 6-inch woofer is designed for smooth, detailed midrange frequency responsiveness with high-end clarity and low-end punch. It has even dispersion for a wider "sweet spot" and user-adjustable controls for different acoustic spaces.

It features a ruler-flat response in a range of 52 Hz-20 kHz at +1.5 dB. The system has two FR (Fast Recovery) Series Amplifiers with HF at 40 W and LF at 100 W, which provides a precise dividing slope, correct phase and low distortion.

The servo loop woofer technology for electronic control and dampening makes the speaker output as true to the incoming signal as possible. The frequency response controls include an 80-Hz low-cut switch and a three-position live/dead switch (-2 dB, Normal and +2 dB). The unit also has a three-position acoustic space switch for compensation in bass response for half-space (-2 dB) and quarter-space (-4 dB) placement.

For more information contact Mackie in Washington state at (800) 258-6883 or visit www.mackie.com.



Audio-Technica

► Continued from page 47

Ultimately, the Audio-Technica AT4047/SV large diaphragm cardioid condenser microphone became that tool, joining the traditionally analog quality of "what we wanted it to sound like" with the exciting and new, yet demanding sound of digital broadcasting.

I first discovered the AT4047/SV microphone while producing the Cleveland Institute of Music's nine live broadcasts a year. I was immediately pleased and impressed with the distinctive, warm sound of the then newly developed microphone.

I also had been using the AT4047/SV in postproduction of The Cleveland Orchestra concerts, which were broadcast over a 255-station network anchored by WCLV. With fully digital broadcast facilities being constructed at Severance Hall in Cleveland, the home of The Cleveland Orchestra, I decided that the AT4047/SV would be perfect for the situation.

Characteristics

The AT4047/SV brings a certain presence to my voice that no other microphone has been able to do in all my years of broadcasting. It was designed to, and successfully provides, the warm sonic characteristics of early F.E.T. studio microphone designs.

It has a wide dynamic range of 140 dB, high SPL capability of up to 159-dB SPL with its 10-dB pad and, most important to me, an exceptionally low self-noise of 9-dB SPL. These combined traits make for an impeccable performance in the critical digital production and transmission arenas.

There is a wonderful brightness to the top end of the AT4047/SV, while still warm and comfortable — not harsh or brash — and the low frequency response is just as nice. Everyone likes the way it sounds, from our on-air personalities to our engineers. And anyone who has been in broadcasting very long at all knows that this level of approval is no small feat.

The AT4047/SV has been so successful at WCLV that we now own 12 of them — two for each control room and four for the station's talk studio.

For more information contact Audio-Technica in Ohio at (330) 686-2600 or visit www.audio-technica.com.

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TECH UPDATES

OC White Readies New Mic Arm

O.C. White is developing a new mic arm and riser designed to hide the microphone wire and improve appearance. The microphone wire is hidden for most of the length of the arm, yet is easy to install and remove.

The new base provides a vertical wire channel through the 15-inch riser, which is prewired to an XLR female imbedded at the top (set-screw removable), and four feet of pigtail extends from the base for the user to wire as needed. This makes attaching a mic cord to the outside of the riser unnecessary.

The factory-installed riser mic wire exits straight down through the countertop or through a side channel at the bottom, as needed by the user. The wire appears only at the mic end, at the "elbow" and the mount end.

The arm also provides a channel for optional mic cables to be added by the user. The user's cable may be prewired with connectors and installed or removed from the arm at any time. It has no threading and there is no need to remove or reinstall connectors.

The wire channel integrates a unique "zip-on, zip-off" cover. This speeds installation and improves appearance. Strong music wire springs provide holding power without wavering.

The support system is available in several configurations and with several optional mounting choices, including a multiple arm mount that accommodates roundtable on-air discussions.

For more information contact O.C. White in Indiana at (765) 935-3893 or visit www.ocwhite.com/html/microphone_arms.html.

Crown Amps Ready to Go

The D-Series of Crown International Inc. professional power amplifiers is designed to be used for moderate power applications such as recording or broadcast studio nearfield monitoring, recording and broadcast studio headphone amp use and others.

The amps are checked to ensure reliability over a variety of loads, which the company says reduces maintenance costs.

Output topology uses the Class AB+B mode of operation in which the driver transistors carry the bias current while the output transistors serve only as boosters. The output transistors sense when the driver transistors are developing significant current draw from the load and take over and deliver the needed current.

The output stage is of a quasicomplementary format using no bias current into the output transistors.

The result is higher efficiency with minimum crossover notch distortion and idling amplifier heat. Protective circuitry includes Voltage-Current limiting that directly senses the overload condition and reacts to relieve the overload. Front-panel indicators are provided to show signal presence and IOC (Input-Output Comparator), indicating distortion greater than 0.05 percent.

The D-Series amps include the D-45 and the D-75A. They have a variety of output power levels. Signal noise is 106 dB and frequency response is ± 0.1 dB from 20 Hz to 20 kHz at 1 W. Input impedance is nominally 20 k-ohm balanced and 10 k-ohm unbalanced, with output impedance at <15 m-ohm in series with <3 mH. The mics have a power requirement of 120 V and 60 Hz.

The D-Series is covered by a three-year, no-fault warranty.

For more information contact Crown International in Indiana at (800) 342-6939 or visit www.crownaudio.com.

QSC Offers Composite Monitors

QSC Audio Products makes the QSC-ACE 500 Series Composite Nearfield Reference Monitors, two-way speakers designed for critical listening applications, including broadcast and stage monitoring.

The ACE 500 product line consists of the ACE 540, the ACE 550 and the ACE 570. The 540 uses a two-way, infinite-baffle enclosure. The 550 and 570 are two-way, ported enclosures with extended low-frequency response.

The three models use a 1-inch dome tweeter for the HF transducer. The 540 and 550 use a 5.25-inch LF transducer and the 570 uses a 7-inch LF transducer.

The 500 Series loudspeakers employ a passive crossover and have a nominal coverage pattern of 120 degrees. Neutrik NL4 Speak-On connectors, binding posts and mounting points are included.

QSC-ACE enclosures use Composilite, a patented carbon fiber technology that the company says yields strong acoustic properties and lighter weight compared to conventional enclosure materials.

Multiple skins of carbon fiber are layered over a phenolic honeycomb core to form a rigid, seamless enclosure. The stiffness of composite construction prevents flexing of the enclosure walls, reducing transmission loss due to wall vibration.

The result is reduced cabinet resonance, increased low-frequency output and greater sonic accuracy.

For more information contact QSC in California at (800) 854-4079 or visit www.qscaudio.com.

**Rode Releases Two Condenser Mics****Rode Microphones**

launched two condenser mics recently for use by audio professionals.

The Rode NT4 is a studio-grade condenser microphone that comes with a case, stand mount, wind shield and custom stereo cables including XLR and mini jack connectors.

The NT4 is suited for location recordings and is designed to be flexible with direct connection to most recording devices. It uses two 1/2-inch capsules in a 90-degree XY arrangement. The mic requires 48-V phantom power, but can also use a 9-V battery.

The Rode NT5 is a condenser microphone designed for optimum instrument recording. Its small size and design allows for effective and subtle positioning, which suits it for close miking. NT5s are supplied as closely matched pairs in a custom carry case with two stand mounts and two windshields.

For more information contact Rode in California at (310) 328-7456 or visit www.rodemicrophones.com.



Rode's NT4 and Accessories

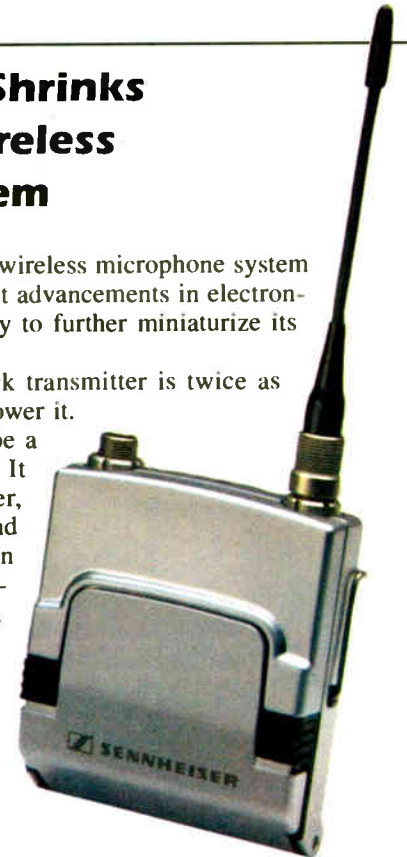
Sennheiser Shrinks SK5012 Wireless Mic System

Sennheiser asserts that its 5000 series wireless microphone system is a standard on Broadway, and that recent advancements in electronics development have helped the company to further miniaturize its microphones.

The size of the new SK5012 bodypack transmitter is twice as large as the two AAA batteries used to power it.

Besides its small size, it is designed to be a quiet and portable wireless transmitter. It generates 30 mW of transmission power, has 16 preset frequencies between 450 and 960 MHz and features audio transmission capability of 60 Hz to 20 kHz with a signal-to-noise ratio better than 110 dB. Power consumption is 115 am at 2.4 V, with a seven-hour battery life for alkalines.

For more information contact Sennheiser in Connecticut at (860) 434-9190 or visit the company Web site at www.sennheiserusa.com.

**Hafler Amp Suits Variety of Uses**

Hafler's P1000 amplifier is designed for broadcast studio monitoring, recording or critical listening, headphone system amplification, surround-sound applications, paging systems, balanced or unbalanced use and 115-V/230-V requirements.

Its circuitry is based on TRANsconductance Active Nodal Amplifier topology, which operates the output stage with its full voltage gain, allowing the input stage to operate from a low-voltage regulated supply.

The signal is then shifted up in level to the high-voltage section by the driver stage, which forms an active node at ultrasonic frequencies. It is designed to result in a stable, linear operation that produces a natural and accurate soundstage with strong image focus.

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



TECH UPDATES

DAS Speakers Have Passive Power

DAS Audio says its Monitor Series boasts powered monitor accuracy in a passive monitor, and consists of two speakers: a model with a 6-inch woofer with a 3/4-inch tweeter, and one with an 8-inch woofer and a 1-inch tweeter. The Monitor 6 is a nearfield monitor and the Monitor 8 can be used in near-to-midfield monitoring.

Both models are two-way vented passive studio monitors for applications in recording and broadcast studios that need an accurate sonic reference. The low-frequency speakers use polypropylene to deliver exact impulse response. The tweeters are ferrofluid-cooled for maximum power handling and minimum power compression.

The high-frequency dome is coupled to a Linear Quadratic Spherical waveguide. The LQS design controls dispersion and achieves higher sensitivity, lower distortion and a stereo image that is wide and uniform throughout the sound field.

The enclosure is built from MDF and Iroko wood side panels. The panels reduce cabinet coloration caused by enclosure vibrations. There are two M6 mounting points on the bottom of the enclosure to facilitate mounting for broadcast installations.

For more information contact DAS Audio in Connecticut at (860) 434-9190 or visit www.sennheiserusa.com.

Earthworks Releases Sigma 6.2

Earthworks Audio Products makes the new Sigma 6.2 speaker, a 40-kHz, Time-Coherent Reference Monitor.

The company says the speaker offers high sonic accuracy with a flat and wideband frequency response, fast well-behaved impulse response and a "step function chart that looks like the theoretical textbook ideal."

It has highly stable impedance, making the Sigma 6.2 less subject to differences in amplifier quality.

The company says that, during construction, care is taken to avoid putting acoustic energy into the air beside and behind the cabinet, which allows the speakers to sit in a room more naturally and with fewer problems.

The port design provides accurate bass reproduction and doubles as a handle. Low frequencies are placed into the room in the correct relationship to the rest of the signal.

Features include magnetic shielding, custom-selected and integrated components for creating matched pairs, point-to-point crossover construction, heavy-gauge air core inductors and polypropylene capacitors.

The monitor's frequency response is 40 Hz to 40 kHz at ±2 dB. It has an 8-ohm impedance, 87-dB 1W/1m sensitivity, power handling at 150 W continuous and 400 W peak and weighs 32 lbs.

For more information contact Earthworks in New Hampshire at (603) 654-6427 or visit www.earthworksaudio.com.

Sony Expands Wireless Mic Line

Sony Electronics presented its new MB-8N Rack Mount Tuner Base and WRU-8N Synthesized Tuner Unit for use with wireless microphones at NAB2002.

The systems are expansions to Sony's 800 Series wireless product line. The units are designed for applications where a large number of wireless microphones are employed, such as a broadcast program production.

The MB-8N has Ethernet capabilities and PC-controlled software that allows users to set up the system, monitor status and operate front panels from a PC, eliminating the need to keep the receivers near the engineer for monitoring. The remote PC interface allows users to

mount the receivers in any location. The supplied GUI can display 16-49 channels simultaneously (three patterns of 16/25/49).

The MB-8N has a headphones connector on the front and a monitor output of D-sub 15 pins connector on the rear. An LCD screen indicates host name and IP address.

The WRU-8N UHF synthesized tuner unit has LED indicators for AF level, RF level, TX battery alarm and an LCD for

indication of channel, frequency, group and TX battery status.

The two systems have dynamic range of 116 dB, frequency response of 20 Hz-20 kHz and high RF reliability. The tuner base is 1 RU high and can accept four WRU-8N tuner units. Four MB-8Ns can be linked to provide 16 channels without an antenna divider.

For more information contact Sony in New Jersey at (800) 686-7669 or visit www.sony.com/proaudio.



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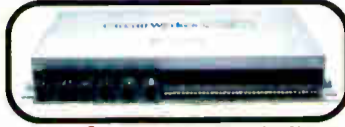
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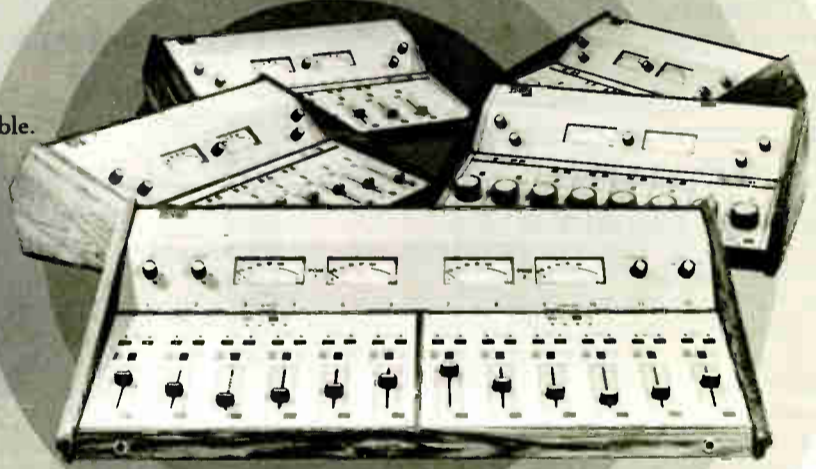
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The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but is a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII or hex character strings.

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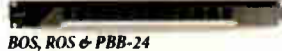
MC-16



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TECH UPDATES

Group One Releases Blue Sky Speakers

Group One Ltd. is offering the Blue Sky System One, the first in a new range of near-field powered monitors. The unit is a 2.1 system consisting of two Blue Sky SAT 6.5 bi-amplified satellite speakers and a complementary powered Sub 12 subwoofer.

The speakers use Blue Sky's proprietary computer-optimized crossover and bass management networks in order to deliver "seamless, full-range" audio from the subwoofer to the main monitors with smooth on- and off-axis frequency response. Sky System One is THX pm3-approved for use in THX pm3 Certified Studios.

The SAT 6.5 speakers operate with a frequency response of +/-1 dB 200 Hz-10 kHz and +/-3 dB 80 Hz-20 kHz. The input impedance is 40 k-ohms balanced, with a voltage sensitivity of 90-dB SPL at 1M, when a 200mV bandwidth limited pink noise signal is applied to the input. It weighs 34.1 lbs. and stands 12 inches high.

The Sub 12 subwoofer has an anechoic frequency response of 30-200 Hz at +/-3 dB and a typical in-room response of 20-200 Hz. The input impedance is 20 k-ohms balanced, and it has a voltage sensitivity of 90-dB SPL at 1M, when a 100mV bandwidth limited pink noise signal is applied to the input. It ships at 70.4 lbs. and is 18 inches high.

Both units are built with 3/4-inch MDF construction with a 1-inch front and rear baffle, and a "viscoelastic" energy-absorbing front baffle coating.

For more information contact Group One in New York at (631) 249-1399 or visit www.g1ltd.com.



Sanken Intros Mini Boundary Mic

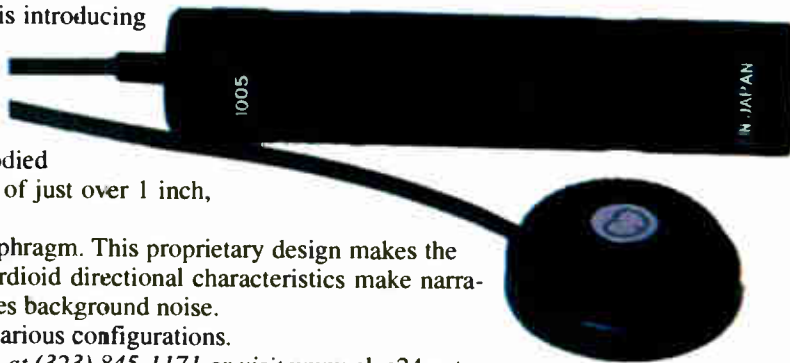
At NAB2002 this week, Sanken Microphones is introducing its miniature CUB-01 Unidirectional Condenser Boundary Microphone for a variety of applications.

The CUB-01 has a design that, according to the company, overcomes the limitations of previous boundary microphones, producing a rich and full-bodied sound. The mic is easy to conceal with its diameter of just over 1 inch, and it can be positioned in a variety of environments.

It has a square-shaped capsule that houses the diaphragm. This proprietary design makes the effective area of the diaphragm larger. The mic's cardioid directional characteristics make narration and dialogue easy to record clearly and minimize background noise.

The CUB-01 is available in gray or beige, and in various configurations.

For more information contact plus24 in California at (323) 845-1171 or visit www.plus24.net.



MBHO Creates Triple-Pattern Microphone



MBHO's MBNM-608 "Lollypop" mic is a triple-patterned large-diaphragm condenser microphone with vintage capsule design and a double diaphragm with a gold sputtered/brass back plate.

The Lollypop offers frequency response from 5 Hz to 20 kHz in an omni pattern at 133 SPL. The pattern switch produces three patterns: omni, cardioid and figure-eight. The selected patterns are largely independent of frequency, thus reproduction of indirect sound has a natural and undistorted character.

The mic is built from components with tolerances in the μ -range.

The responses per pattern are 5 Hz-20 kHz for the omni pattern, 10 kHz-20 kHz for cardioid and 40 Hz-18 kHz for figure-eight.

For more information contact MBHO in New York at (718) 963-2777 or visit www.mbho.de.

Independent Imports Three New Mics

Audio product distributor Independent Audio recently received three new microphones from European manufacturers for the U.S. market.

The newest models of the OKM Soundman stereo headset microphones from Germany are the Pop (PX) and the Pop Studio (PXS).

The PX and the PXS are designed for above-average SPL, and the Pop Studio also has a channel difference of less than 0.5 dB. The mics are designed for use with minirecording systems (DAT and MD) and provide strong stereo sound in a variety of applications. The mics can plug into computer sound cards, minirecorders or camcorders.

Independent also has the first new microphone released by U.K.-based Coles Electroacoustics in 38 years. The Coles 4040 is a ribbon mic designed for high-quality studio recording. It features an internal shock mount, high output and a strong frequency response.

For more information contact Independent Audio in Maine at (207) 773-2424 or visit www.independentaudio.com.



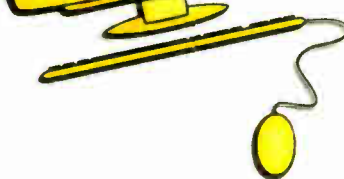
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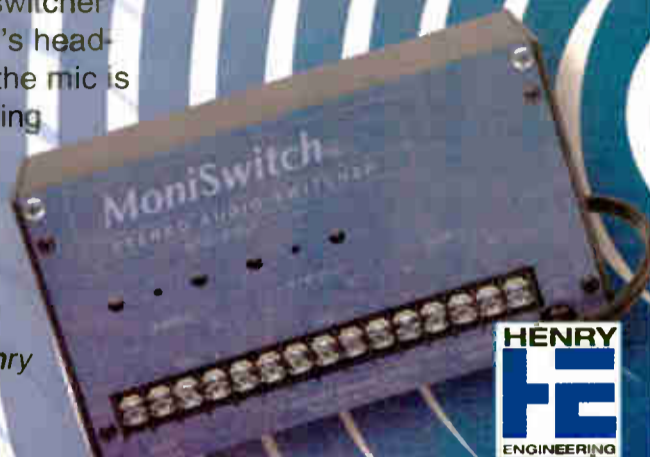
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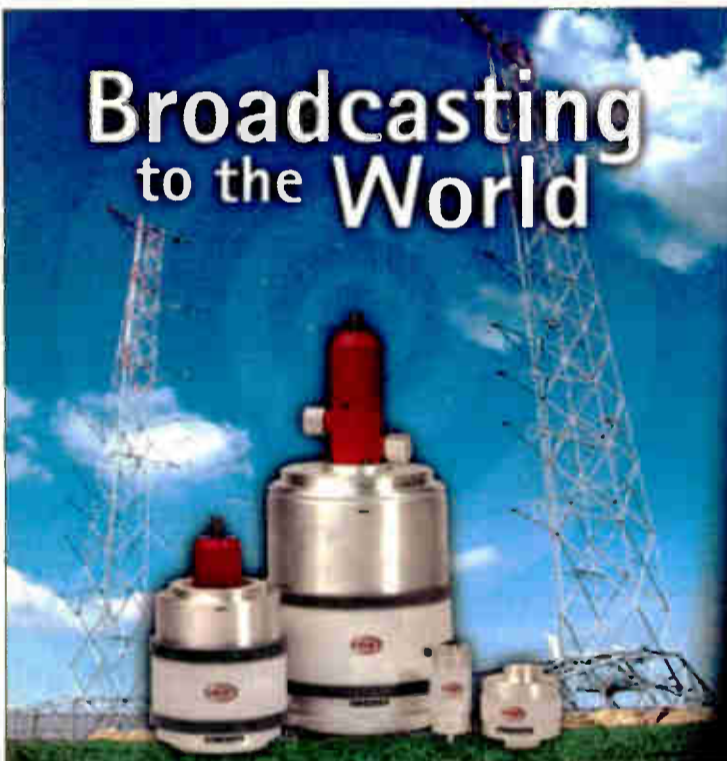
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TECH UPDATES

PMI Audio Unveils B Series Mics

PMI Audio Group is building on the foundation created by its Studio Projects C Series microphones with the B Series.

The three-model B Series is similar to the Cs, but uses a new design with three-micron capsules, a minimal number of components and a new internal suspension system that isolates the capsule from the body of the mic.

This "Isolation cone" (Isocone) eliminates the need for a shock-mount suspension clamp during use.

The B1 condenser mic is a large-diaphragm cardioid microphone that employs transformerless design and low noise.

The B3 (shown) is a multipattern large-diaphragm condenser microphone. It offers three recording pattern positions (cardioid, omni and figure-eight) with a pad and Hi-Pass filter. It is designed to ensure quality recordings while still offering linear response.

The B1 and B3 use pressure-gradient transducers and each have a 1-inch, three-micron Mylar capsule.

The TB1 is a vacuum tube (valve) microphone that uses a hand-selected 6072 "dual triode" vacuum tube to ensure consistency. PMI says that the mic provides "the warm, transparent sound of an expensive quality vacuum tube microphone," but at a lower cost.

For more information contact PMI in California at (877) 563-6335 or visit www.studioprojectsusa.com.



Schoeps Offers Colette Series

Schoeps' Colette microphones are designed to provide accurate, neutral sound and to offer a modular approach to sound recording.

The Colette Series has a variety of powering options, 20 capsules and a range of active, passive and miniature accessories to help with microphone placement and pattern selection.

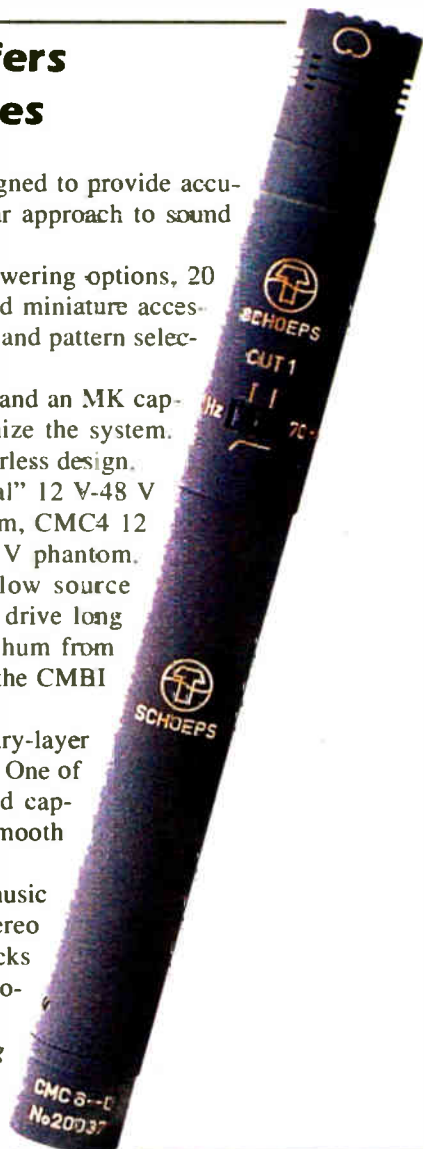
A Colette consists of a CMC amplifier and an MK capsule. Accessories can be added to customize the system. The CMC amplifier is a Class A transformerless design.

Users can choose the CMC6 "universal" 12 V-48 V phantom shown, the CMC5 48 V phantom, CMC4 12 V T parallel powering or the CMC3 12 V phantom. The amplifiers share high output and low source impedance. The company says they can drive long cable runs without risking signal loss or hum from RF pickup. A battery-powered version of the CMBI and the M222 tube design are available.

Two variable-pattern and two boundary-layer types are available among the 20 capsules. One of Schoeps' best is the MK 41 supercardioid capsule. It combines high directivity with smooth off-axis response.

Among its uses are as a spot mic for music recording, vocals and VOs or in an M-S stereo setup. Off-axis response helps to make tracks sound good and reduce difficulties for editorial and post-production.

For more information contact Redding Audio Inc. in Connecticut at (203) 270-1808 or www.reddingaudio.com.



Fostex Launches Biamp Speaker

Fostex America recently released its Model PM-1, a biamped powered monitor system designed with performance specifications such as a 55 Hz-20 kHz range and a maximum peak of 118-dB SPL at one meter.

The new model features 120 W of biamped power, consisting of a 6.5-inch LF driver and a 1-inch soft dome tweeter, driven respectively by 75 W + 45 W at 8 ohms. Each amplifier was designed for the driver it powers. The system is made to meet a specific price/performance ratio set by Fostex after conducting market research.

The 6.5-inch LF driver was developed to output highly pure music reproduction by employing cone material technology. It uses a mixture of cut and milled fibers that are made from aromatic polyamide. It is impregnated with resins to achieve high rigidity and optimum damping. The voice coil is made of high-purity copper wire to achieve low distortion.

The 1-inch soft dome tweeter employs the Fostex UFLC technology (polyurethane film laminated cloth) to achieve low mass and high-stability performance. The cone has an olefin film thermally adhered to its surface to control frequency response and to establish long-term reliability.

For more information contact Fostex in California at (562) 921-1112 or visit www.fostex.com.

Classé Makes High-End Omega Amp

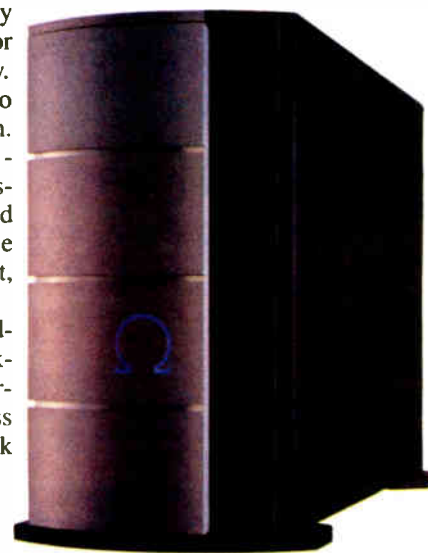
The Omega Mono is a reference standard power amplifier for high-end systems built by Classé Audio Inc. It is a high-power, high-current mono power amp that uses balanced audio circuitry from input to output and is able to accept balanced and single-ended inputs. According to the company, it "has almost unlimited power output and current delivery."

The symmetrical circuitry is set up so the positive and negative signals are a mirror image. The standard configuration combines J-FETS, MOSFETS and 32 high-power, bipolar transistors, where one of the fast transistors controls the heavy-voltage or current-amplifying bipolars. The devices switch on and off as the controlling devices to provide power and speed. The 32 bipolars are arranged in a parallel configuration. They work to prevent significant voltage drops for strong power-supply regulation and stability.

The power supply allows the amp to double its output into 4, then 2 then 1 ohm. Users are able to access 4,000 W into 1-ohm impedance. A 3 KVA toroidal transformer is linked to a 358,000 microfarad array of small capacitors that can charge and discharge faster than normal equipment, resulting in better response to the music.

The amp uses an RCA phono single-ended socket and an XLR balanced input socket. The unit is set to run in Class A at normal listening levels, but can shift to Class A/B when near full gain or during peak requirements.

For more information contact Classé in Quebec at (514) 636-6384 or visit www.classe.com.



Sony Debuts WRT-8B Body-Pack Xmtr

Sony Electronics recently introduced the WRT-8B UHF Body-pack Transmitter at NAB2002. It is the newest member of Sony's range of UHF synthesized wireless microphone systems for use in fast-moving productions.

The unit measures 2.5 inches x 3 inches x 1 inch and weighs 4.9 ounces with two AAA batteries, with which it can operate for 13 hours at 10mW or six hours at 50mW. The unit has a die-cast magnesium body that houses a stable, low-noise transmitter.

The WRT-8B uses a Phase Locked Loop frequency synthesized system that generates a stable carrier frequency and enables the unit to achieve its high carrier stability. It transmits a 32-kHz tone signal along with the program audio signal.

This tone is recognized by the squelch circuit in Sony wireless microphone receivers and eliminates the output of undesired signals and noise from other equipment, including RF noise and popping when the transmitter is powered on or off.

Other features include: switchable input level and a variable attenuator, battery alarm indicators, lavalier microphone capability and switchable AF input and RF output levels. It comes with a soft case, spare battery case, microphone cable, a rewriteable ID sheet and microphone and line-level input.

For more information contact Sony in New Jersey at (800) 686-7669 or visit www.sony.com/proaudio.



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TECH UPDATES

Fostex Revives M11 and M88 Mics

Fostex America promises that its newly revived M11RP and M88RP microphones "have the durability of a dynamic element, the clarity of a condenser capsule and the warmth of a ribbon design."

Though unavailable for a while, they were brought back into service because of continued customer demand. The microphones are backed by 20 international patents on their transducer technology and are hand-made.

The mics do not require phantom power and have no onboard circuitry to create noise, and, according to the company, offer the quality of a condenser microphone. Their level of distortion is rated at less than 0.2 percent at 130 dB.

The M11 is unidirectional with a double-suspended capsule and -51 dB, 2.8mV/Pa sensitivity. The M88 is bidirectional with front/back identical sound quality and -52 dB, 2.5mV/Pa sensitivity. Both mics have three-position filters and 600-ohm impedance.

The company says the mics' immediate advantages over normal ribbon technology are their strength and durability. Ribbon microphones have fragile elements, making them less usable for outside applications or placements involving high sound pressure level. The M11 and M88 can endure close percussion and loud amplifier microphone placements without danger to the capsule.

The M11 and M88 have large, low-mass printed ribbon diaphragms for fast response time. They come in hard leatherette cases; each has a built-in swivel microphone stand holder with adapters and cable.

For more information contact Fostex in California at (562) 921-1112 or visit www.fostex.com.



The Fostex M11RP mic

Hafler Designs Smaller Speakers

The magnetically shielded Hafler M5 speaker is a 5.3-liter, fourth-order, Butterworth-vented, two-way loudspeaker designed to work alone or in conjunction with Hafler's line of professional amplifiers. It also was designed to work with the Hafler TRM10s active subwoofer.

The M5's 5/8-inch thick MDF cabinet has a front-firing slotted port tuning the system to 70 Hz. The low-frequency character allows smooth response extending below system tuning. The small panel size and internal bracing reduces wall flexing and midband resonance, and high cabinet rigidity improves low-frequency midbass coupling.

The low-profile system enables it to project a focused and reflection-free natural soundstage in small console, workstation or meter-bridge applications, the company said.

The unit's tweeter uses a proprietary 25 mm silk dome and exponential horn waveguide combination, and is the same unit found in the TRM6 active monitor. The exponential horn loading provided by the waveguide sets the width and depth of the soundstage. The waveguide also provides a rocker switch that allows the user to select between 0- (flat) and a -3-dB control in tweeter output.

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



ESnet Engine Links Audio Sources

Digigram recently released its ESnet: EtherSound Core Audio Engine for connecting audio sources to networked audio devices.

ESnet uses the company's EtherSound networked audio technology. It is designed to help established technologies create audio networks using standard Ethernet cabling and components.

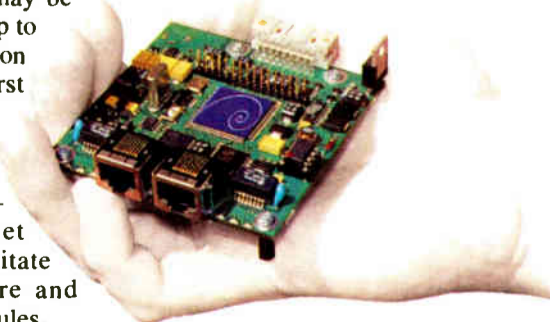
The ESnet module is a component that manufacturers can integrate into audio equipment such as loudspeakers and amplifiers. Once implemented, ESnet becomes the core audio engine for low-latency distribution over standard Ethernet.

Sixty-four channels of 24-bit digital audio, plus bidirectional control information, can be transported to any number of networked audio devices.

The modules can be connected serially. An unlimited number of modules may be daisy-chained. Modules can be up to 100 meters apart with no limitation on the distance between the first and last modules in the chain.

Because EtherSound is compatible with Ethernet 802.3 and 100BaseTX full-duplex standards, off-the-shelf Ethernet switches may be used to facilitate complex network architecture and extend the distance between modules.

For more information contact Digigram in Virginia at (703) 875-9100 or visit the company Web site at www.digigram.com.



B&W Offers Range of Unique Speakers

B&W Loudspeakers, based in England, makes a variety of speakers including the Nautilus 805 to the VM1.

The 805 is part of the Nautilus 800 series. It uses tapered tubes filled with absorbent fiber that soaks up sound energy from the back of each driver to prevent interference with the sound from the front or generating resonance.

A tube is in the tweeter of each speaker. The metal dome diaphragm is driven by a high-efficiency motor system with a ribbon-wire voice coil and magnet for an extended frequency range.

The driver's narrow frontage and free mounting on top of the speaker create a wide dispersion. The series' combination of a sphere and tube provides a resonance-free environment for the driver beyond the crossover frequency.

The 805 unit is a two-way vented box system with a frequency response of 56 Hz-20 kHz at +/-2 dB. Impedance is 8 ohms, and the recommended power is 50 W-120 W. It weighs 20 pounds and stands 16.3 inches high. It is equipped with a Kevlar fiber cone and magnetic shielding in a Matrix-brand cabinet.

The lower-end, magnetically shielded VM1 has a frequency response of 75 Hz-20 kHz at +/-3 dB and an impedance of 8 ohms. The power source should be 25 W-100 W. It weighs 6 pounds at 20.6 inches in height. The body of the unit is molded in high-strength polypropylene. The dimpled Flowport is integrated into the rear of the speaker and reduces acoustic interference from the speaker's breathing in and out of air.

For more information contact B&W in Massachusetts at (978) 664-2870 or visit www.bwaudio.com.



The Nautilus 805 by B&W

Tannoy Subwoofer Handles 5.1

The Tannoy PS350B from Tannoy/TGI North America is a 350-W, 15-inch active subwoofer. It is designed for professional and project studio use and allows users to reference between a full-bandwidth stereo mix and mixing for the 5.1 format.

Bass Management with the PS350B requires LF, C, RF, RR, LR, and LFE discrete outputs from the signal source. The line-level signal source output connects to the subwoofer amplifier "Sub In" balanced input.

The Left Front, Center and Right Front signal source outputs connect to the Left, Center, Right balanced inputs on the PS350B, respectively.

Users manage the PS350B by pressing a footswitch at the end of a cable connected to the sub. If the user deactivates Bass Management, two operations occur simultaneously: The LCR 80-Hz high-pass filters are bypassed, making the outputs full-frequency, and the LCR signal is removed from the subwoofer signal path.

The only signal present at the subwoofer will be from the LFE input. Pressing the button again reactivates Bass Management.

The unit's LFE input is selectable between a fixed low-pass filter point of 120 Hz at a rate of 12 dB per octave, or an "all pass" mode that uses the full bandwidth of the amplifier. The fixed crossover setting gives added protection to the subwoofer by limiting bandwidth, but without compromising program material. Alternatively, the "all-pass" mode allows unfiltered input.

For more information contact Tannoy/TGI North America in Ontario at (519) 745-1158 or visit www.tannoy.com.



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AMPLIFIERS

Want to Sell

Hughes & Kettner tubeman pre-amp, \$175, very little use. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Yamaha P2100-310W; Orion XTR 475 (xtreme power x over); Orion xtreme power/the beast; XTR 2250, BO. Marty Riemenschneider, Mitchell Bdcg, Omaha NE. 402-342-2220 x350.

Want to Buy

McIntosh C-20 stereo preamplifier. Mike Stosich, Esoteric Sound, 4813 Wallbank Ave, Downers Grove IL 60515. 708-431-4560.

RCA, Altec tube amplifiers & mixers in any condition, working or not. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

ANTENNAS/TOWERS/CABLES

Want to Sell

AM GROUND SYSTEMS: Reliable, On-time Installation, Quality Workmanship, Ground System Evaluation & Repair. www.amgroundsystems.com 1-877-766-2999.

Dielectric 3-5/8" motorized four port coaxial switch. Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.



100' Pirod free-standing galvanized tower, on the ground. Never erected, includes all drawings & parts. Available immediately in Western PA, \$4750. Jerry Meloon, WDBA-FM, 814-371-1330; jerry@wdba.com.

Shively 6814 CP, 8 bay antenna tuned to 105.7, on tower for approx 2 yrs, \$3995. Gary Wachter, KRNB, 621 NW 6th St, Grand Prairie TX 75050. 972-263-9911 x550.



AUDIO PRODUCTION

Want to Sell

Roland DM-800 & DM80R multitrack disc recorders, BO. Marty Riemenschneider, Mitchell Bdcg, Omaha NE. 402-342-2220 x350.

AUTOMATION EQUIPMENT

Want to Sell

Scotts Studio Axis. Very reliable system, 3 stations on-air & full production, 2 years old, \$6000. Todd Noordyk, Great Lakes Radio Inc., 2025 US 41 W., Marquette MI 49855. 906-228-6800.

Antex Electronics Series 2 SX8 digital audio processor cards (3), for use with Smartcaster; Older Smartcaster with opto-isolated relay card. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

Arrakis DL2 w/4 controllers, no reasonable offer refused. Kevin Guffey, WJIA, 5025 Spring Creek Dr, Guntersville AL 35976. 256-505-0885.

Computer Concepts DCS includes server, (2) DCS workstations & (2) SCSI drives, a complete digital automation system, BO. Kurt Heminger, WCSI, 3212 Washington St, Columbus IN 47203. 812-372-4448.

Sony Jukebox CDK006 autodisc loaders, includes (2) autoseg units & all cabling, BO. Kurt Heminger, WCSI, 3212 Washington St, Columbus IN 47203. 812-372-4448.



CART MACHINES

Want to Sell

AudiCord R/P stereo S26, BO; AudioCord Dual R/P stereo DL-DS, BO; AudioCord DL-PM, BO; Tapecaster 700P, BO; BE 3200 PRS single play, BO; BE 5303B triple deck, BO. Kurt Heminger, WCSI, 3212 Washington St, Columbus IN 47203. 812-372-4448.

BE triple deck in good condition, record mode needs work, 200 carts free, \$300/BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

Harris 994-7994-001 stereo PB cart machines (2); Harris 994-7998 stereo rec/play/ter; (2) Harris triple deck P/B; Audicord E-20 RP mono; Dynamax CTR-12 P/B; Omega ITC mono R/P; ITC 99B P/B. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

ITC Delta PB machines (6); (4) ITC Delta IV R/P; (6) ITC Omega PB; (2) ITC Series 2 PB; ITC Delta III triple deck PB; ITC ESLV; (2) ITC 99A & ITC 99B, BO. Marty Riemenschneider, Mitchell Bdcg Co, Omaha NE. 402-342-2220 x350.

Want to Buy

Fidelipac Dynamax. Need DCR-1000 deck w/record electronics or a DCR-10 deck equipped for recording. Chuck Niday, WVMR, Rt 1, Box 139, Dunmore WV 24934. 304-799-6004.



CD PLAYERS

Want to Sell

JVC XL-M505 CD auto change, 6 disc; Kenwood 6 disc DP-M3370; (2) Pioneer PDF-100, 100 disc players; Teac PD3-25. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

Sony CDK3600 CD jukebox, never used, \$1500 ea. Gary Wachter, KRNB, 621 NW 6th St, Grand Prairie TX 75050. 972-263-9911 x550.

COMPLETE FACILITIES



CONSOLES

Want to Sell

ADM-2400 console modules & parts. Mic-Line, EQ, buss select, echo rtn, faders, etc., with schematics. \$25 ea +shpg (quantity discounts). Morningstar Sound, 732-938-4217; morningstar@Monmouth.com.

Ampro 10 channel stereo, works; BE 4 channel mono board; (2) Harris 5 channel stereo, works. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

Microtrac 6618, 6 channel console, BO; Mackie 14 channel MS1402 VLZ includes manual, BO. Kurt Heminger, WCSI, 3212 Washington St, Columbus IN 47203. 812-372-4448.

Ward Beck production board, max 14 channel, R-1200, stereo 2 mic 9 line input channels; Audiotronic 218; BE 5M250, BO. Marty Riemenschneider, Mitchell Bdcg Co, Omaha NE. 402-342-2220 x350.

Want to Buy

Audioarts A-50 needed for production room rebuild. Chuck Niday, WVMR, Rt 1, ox 139, Dunmore WV 24934. 304-799-6004.

Western Electric 25B. Paying up to \$7500 for this console & always buying WE mics, tubes, catalogs & turntables. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

LIMITERS/AUDIO PROCESSING

Want to Sell

CRL SMP-950, AM stereo matrix processor, like new, \$1200; CRL SGC-800 stereo gain controller, like new, \$900. Mike Walters, WAUK, 1801 Coral Dr, Waukesha WI 53186. 262-544-6800.

Digitech DSP-256XL digital multi-effects processor/reverb/delay 100 presets 100 user presets, \$200; dbx 166 2 channel gated limiter compressor, like new, \$250. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

CBS Labs Audimax 4450A stereo limiter; Processing Solutions FM Flexmod, no power cord; CRL SPP-800 stereo prep processor; (2) Inovonics David II model 716 stereo processor/generator; dbx 140X type II NR; Valley Intl 400 voice processor. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

CRL SEP 800 processor; CRL SEA 800 compressor; CRL Ca-300A 92 kHz sub carrier gen; CRL SCG controller; Apex Vicalante mdl 700; Modulation Sciences MYB2 Stereo Maxx, BO. Marty Riemenschneider, Mitchell Bdcg Co, Omaha NE, 402-342-2220 x350.

Gates SA39B AM limiter, will trade for RW20 mike or Urban XT 6 band EQ. All there & looks good, BO. CE Jones, WSHG, 106 Carolina Ave, St George SC 29477. 843-563-8097.

Optimod 8100 w/X.T. chassis in good condition, \$2200/BO. Greg Myers, KCFY, 1921 S Rail Ave, Yuma AZ 85365. 928-341-9730.

Urban 2200 Digital FM, easy set-up, powerful, analog & (2) composite outputs. In use 18 months, like new w/manual, \$2500. Jack Taddeo, Radio K-T, 111 S Washington St, Park Ridge IL 60068. 847-518-0340 or jtaddeo1@earthlink.net.

Urban 8200STU studio chassis in excellent condition, call for price, 877-722-1031.

Shure SR-107 EQ; Teac EQA-5 graphic EQ; mod monitors; Gates Solid Statesman FM limiter; Motorola C-Quam Am stereo package (exciter/mod monitor); TFT stereo monitor 724A, head unit; TFT FM mod monitor 763. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

Want to Buy

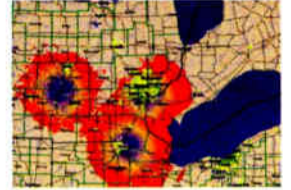
Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

Collins 26U-1 limiter for parts or just the meter. Tim Coffman, 858-571-5031.

Urei, Universal Audio, dbx, Collins, RCA, Gates, etc. Call anytime, Tim Coffman, 858-571-5031.

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Urban XT 6 band EQ for use with 8100/A1. CE Jones, WSHG, 106 Carolina Ave, St George SC 29477. 843-563-8097.

MICROPHONES

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EV644 with shockmount & cable, very nice, \$200. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Want to Buy

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. E-mail: billbryantmgmt@yahoo.com.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

Neuman, RCA, Shure, AKG, Beyer, others 1950-1990. Call anytime, Tim Coffman, 858-571-5031.

RCA 77DX/44BX. Will pay \$1000 for these mics. Call anytime. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

MISCELLANEOUS

Want to Sell

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

Motorola TA-42 input & output terminals, T&R 2-25 amp fuses, 1-15 amp fuse, \$30. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Tascam patchbays (2), new PB-32-4 & 32P 1/4 to 1/4 to RCA, \$115/pair; Sound Level meter, new with case & manual (Radio Shack), \$50; DOD, Direct Box 260 2-1/4" to XLR DI, \$12. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Two boxes (19 total) of new motors. Oriental motor, Japan S-301 motors, 7.5W 115V 1500/1800 rpm, \$30/all. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

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20' satellite dish; Format Sentry I-S 12C with control card; wire cage card Carousel, revolves on rollers, holds 200 cards, great condition; On-air (recording) light, large, approx 7"x5"; directional FM antenna, new; 7/8" coax cable, 100'; 1-5/8" coax cable, various lengths between 75-140'; 450' of 1-1/4" coax cable, like new; Sound Design Am/FM stereo rcvr dual cassette recorder model 5888, blk; Huey Phillips weather proof aluminum tower light boxes, new. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

FM translator equipment donation for non-commercial educational Christian station. Rev. Bill Baker, WTMV, 409 E Main St, Youngsville PA 16371. 814-563-4903.

Headphone amps; audio switchers; audio amps; Moseley STL equip; Ramco DML-1s; dbx 150x; RCA mod monitors; satellite receiver; EQ; grounding kits & a whole lot more, for complete list of equipment/BO's. Marty Riemenschneider, Mitchell Bldg Co, Omaha NE, 402-342-2220 x350.

RCA 77-44-74 etc, ribbon mics, on air lights, console, manuals, tubes, etc. Highest prices paid. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

Sage Endec EAS unit, excellent condition, BO. Kurt Heminger, WCSI, 3212 Washington St, Columbus IN 47203. 812-372-4448.

Want to Buy

Old Audio Engineering magazines prior to 1953. Mike Stosich, Esoteric Sound, 4813 Wallbank Ave, Downers Grove IL 60515. 630-960-9137.

RCA on-air lights in any condition, working or not, will pay best prices for them. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

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Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

Belar mod Mon Set FMM-2 FM mon, FMS-2 FM stereo mon, RFA-1 RF amp, recently removed in very good condition, \$1000/all 3. Jack Taddeo, Radio K-T, 111 S Washington St, Park Ridge IL 60068. 847-518-0340 or jtaddeo1@earthlink.net.

QEI-691/01 FM modulation monitor, test set, call for price, 877-722-1031.

RECEIVERS/ TRANSCEIVERS

Want to Sell

Zephyrs 4 cards #304 in excellent condition, BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

RECORDERS

Want to Sell

Ampex AG-440B, 2 channel electronics, rolling case, xtra direct drive capstan motor, manuals, \$250/BO +shpg. Morningstar Sound, 732-938-4217; morningstar@Monmouth.com.

HHB MDP500 recorder with multiple connections & manuals, used only 12 times, \$750. For more info call Lowell Davey or Michael Raley at Bible Broadcasting Network, 8030 Arrowridge Blvd, Charlotte NC 28273, 704-523-5555 or for pictures at MRaley@bbnradio.org.

Audiovox A-77 r-r. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

Concertone 7" reel, 1/4 track stereo continuous play reversing, BO for all or part. W.H. Brown, WWBC, 645 Anderson Ct, Satellite Beach FL 32937. 321-777-0265.

Magnecordettes (2), (1) 1/2 track, (1) full track, (1) PT63A, & (1) PT6 drive & electronics, spare capstan drivers, extension arms for 10" reels, BO on all or part. W.H. Brown, WWBC, 645 Anderson Ct, Satellite Beach FL 32937. 321-777-0265.

Revox A77, BO. Kurt Heminger, WCSI, 3212 Washington St, Columbus IN 47203. 812-372-4448.

Tascam 32 in excellent condition w/rack mount, \$800/BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

Tascam DA-30 MK II, DAT R/P, excel cond, low hours, free shipping, \$600. Jay Swafford, Jay Swafford Voiceovers, 173 Fox Run, Springfield TN 37172. 615-384-4121.

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Want to Sell

REMOTE BROADCAST TRUCKS & VANS: 65' surveyor, Camera Controller with Elevation Azimuth Dual Controller, '97-'98 Ford E-350 cargo vans, G/A, low miles, 5 available starting at \$25,500; 65' Will-Burt, Pneumatic Air, '91 Ford E-150 cargo van, G/A, \$23,500; 110' Surveyor, '99 Ford F-550, 2,700 miles, Powerstroke D/A, Statpower AC Inverter, Prowatt 1500 DC/AC Inverter, Elevation Azimuth Dual Controller G5500, \$59,500. Call Rob, 206-824-6340.

BE/Marti SMARTI pots line codec/mixer, (1) RKS-111 in rack mount, (1) RKS-411 in portable bag, excellent condition, \$1750 ea. Gary Wachter, KRNB, 621 NW 6th St, Grand Prairie TX 75050. 972-263-9911 x550.

Comrex Nexus ISDN codec unit, works perfectly, used 1 yr, \$1300. Pitroad Racing Network, WCON, Charles, 706-886-0652.

Gentner GSC3000 I/O 16 unit, excellent cond, \$2250; Gentner GSC3000 voice unit, excellent cond, \$895. Gary Wachter, KRNB, 621 NW 6th St, Grand Prairie TX 75050. 972-263-9911 x550.

REMOTE EQUIPMENT RENTAL Silver Lake Audio (516) 763-1776 silverlakeaudio.com

Moseley MRC-1600 complete studio/transmitter package with 2 spare Telco cards; Marti Whip, fiberglass cracked, but works fine. Kelly Wallingford, WIRV/WCYO, 1030 Winchester Rd, Irvine KY 40336. 606-723-5063.

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McMartin BF25K 27.5kw FM xmtr refurbished by Goodrich Enterprises, tuned to 104.5 in Dallas TX standby service, exciter not included, \$7850; Altronic 25kw FM dummy load in excellent condition, \$2750. Gary Wachter, KFINB, 621 NW 6th St, Grand Prairie TX 75050. 972-263-9911 x550.

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◆ READER'S FORUM ◆

Art Roberts

It's with much sadness that I note the passing of Art Roberts, who was the subject of an item in Radio World (March 1, "The Wisdom of Art Roberts").

Art was a wonderful broadcaster who worked for legendary stations such as WOKY, KNBR, WKQX, KLUV, WCFL, and of course, over 10 years at WLS.

His love for music and dedication to creating a great, entertaining show were surpassed only by his affection for his listeners and colleagues. He treated them with respect, never talking down to them, always interested in what they had to say. In addition, it was clear that his family was always number one — followed closely, I suspect, by his horse!

I had the pleasure of meeting Art about two years ago. He and his family were in Chicago for a wedding and I had invited him to visit Windy 100 and to lunch.

I figured that he would be very busy and politely decline, but to my surprise Art was more than happy to stop by. He was an absolute delight. He had lots of questions about our stations and the technology we used.

We talked about the state of radio and he was happy to chat with some of the staff. We had lunch and swapped great stories. I was thrilled to spend the afternoon with a radio legend. He wouldn't even let me pay the restaurant check!

As time passed, we continued to chat. Then came the news that Art had suffered a stroke, but he came through strong with the support of family and friends. And even though his physical body didn't move the way it used to, Art's mind was as sharp as ever. I always enjoyed trading stories and pleasantries with him via e-mail. His Web site was a treat as he offered advice, support and his special brand of wit.

Unfortunately Art suffered another stroke in February and passed away on

March 6 near his home in Nevada.

I always told Art how I looked forward to his return to Chicago for another chance to pay for lunch. I sure hope he knows how much I appreciated his kindness, concern and friendship.

Scott Childers
Midday Air Personality
Windy 100.3 FM, WNND
Chicago

Paul Schafer

With interest I read your article about Paul C. Schafer ("The Father of Automation," RW Online), and though I know Mr. Schafer has won many awards for his engineering expertise, I would also brand him the "Father of the Demise of Personality Radio," because of his "invention."

I was employed at a small-market station in Bowling Green, Ky., WLBK AM-FM, in the mid-1970s when, as a program director/morning man on an up-and-coming AOR-formatted station, I found out about disturbing news that the "home office" had purchased an "automation" system for the FM side and "We'd need no DJs!"

The management thought, of course, about the eventual savings of a few dollars. On the other hand, I — along with a handful of minimum-wage employees who not only loved our format/music but lived it — thought the stations had "personality." Then the automation arrived. MOR Muzak from the '50s and '60s on 16-inch reels. Listenership plummeted!

The automation stayed in place for another five or six years till the station sold. The new owners threw it out the back door with the rest of the garbage!

What you hear on the air today in most markets can be attributed to Mr. Schafer: automation that plays the same mindless drool from a satellite feed, or a hard drive, server, etc., etc., and kids who have no idea how much fun radio used to be when "personality" got to shine through the airwaves.

Jay Swafford
Audio Engineer
News Channel 5 Network
Nashville, Tenn.

Pizzi on IBOC

Congratulations and amen to Skip Pizzi's extremely timely, clear and well-reasoned article about the closed development of Ibiquity's IBOC system (March 1, "FMX+RBDS=IBOC").

Satellite and Localism

We note with interest the continuing tempest over whether XM Satellite Radio secretly is planning to use on-the-ground repeaters to build a local broadcasting infrastructure.

The NAB certainly isn't asleep at the switch. In letters to the FCC, the NAB wrote that XM has obtained a patent on technology "intended to do precisely what XM told the commission it would

not — use its growing network of terrestrial repeaters to provide locally differentiated advertising and programming. ...

"To put it bluntly," NAB continued, "while XM was telling the commission that it had no plans to use repeaters other than to fill gaps, it was actively developing technology specifically intended to use repeaters to provide locally differentiated material."

When XM and Sirius won satellite bandwidth at auction from the FCC, they promised not to compete locally. Is the XM camel trying to sneak its nose under the tent? XM says no. It says patenting the discovery was routine protection of intellectual property.

"We've been forthright from the beginning," a spokesman said. "We've said from the beginning that we would do a national service."

The NAB has been worried about this for years. Now it wants the FCC to consider whether it can trust the need for a network that has far more repeaters, "many of which operate at very high power levels," than originally specified. NAB points as an example to Boston, where XM has 60 high-power repeaters.

It urges the FCC to adopt the "no-local" clause used in its temporary authorization paperwork: "SDARS terrestrial repeaters may not originate any programming and are restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to the SDARS subscriber's receivers." We concur.

NAB also wants the FCC to require a specific showing from XM demonstrating the need for each repeater before the commission grants the repeater a license or extends a temporary operating authorization. Again, good thinking.

A funny taste remains. Even if XM has the best intentions, what would happen if satellite radio doesn't gain consumer acceptance? Can XM promise never to come back to the FCC asking for permission to go local in a quest to survive? Could future political leaders or regulators be more hostile to broadcasters, more open to giving satellite a back door to localism, thus hacking away at the underpinnings of radio as we know it?

Competition means more choice and better goods at lower prices. We like that. It's a Darwinian world. But competition also must be above-board.

XM — and more important, the FCC — should take steps to assure us that satellite will remain national, not local. The NAB is right. The FCC should condition licenses for any terrestrial satellite repeaters on an "iron-clad commitment that they will not be used to permit locally differentiated programming."

Kudos to the NAB for keeping its eyes open on behalf of its members.

— RW

Many of the shareholders of Ibiquity were duplicated as voting members of the NRSC Evaluation Working Group that recommended the technology to the FCC. Hardly a model for objectivity.

My understanding is that the multiple program stream capability of the digital system is not going to be exploited, thereby killing a valuable public service before it is ever born.

Another feature of the proposed IBOC system that has gotten little press is the intention of Ibiquity to charge either an annual fee or one-time fee per transmitter for use of their proprietary technology.

So get this: The sole player out there asks the federal government to grant it an exclusive franchise so that you, Mr.

Radio Broadcaster, can pay equipment manufacturers an increased price because their equipment contains Ibiquity's proprietary technology and then you can pay them again at whatever price they set for broadcasting using their proprietary technology.

Mr. Barnum would be proud.

The cynic in me says this is just a scheme to exploit a mature industry and sell a whole lot of broadcast equipment and receivers to broadcasters and the American public with little advantage to either.

Lamar Marchese
President and General Manager
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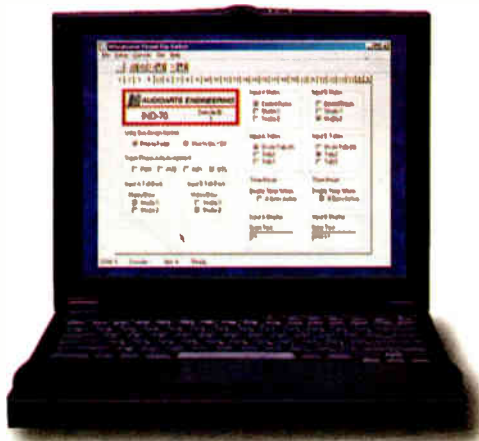
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AUDIOARTS DIGITAL D-70



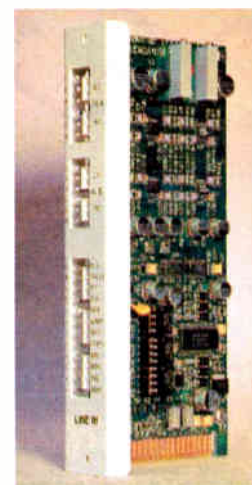
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