Production Menu
A tasty selection of the latest soundcards and digital audio editing products. In *Buyer's Guide*.

Page 57

Studio Sessions
We try out the Comrex Matrix codec system and Eventide Orville effects processor.

In This Issue

Radio World®
The Newspaper for Radio Managers and Engineers
March 14, 2001

INSIDE

NEWS

ENGINEERING

GM JOURNAL

ANOTHER WINNER

NEWS ANALYSIS

Webcasting Could Cost Broadcasters

Groups Re-Evaluate Web Presence, Some Curb Streaming in Light of Possible Retroactive Fees

by Randy J. Stine

WASHINGTON Many radio station executives who hoped to turn the Web into a revenue source have been bumped offline, at least temporarily.

If not overturned, a ruling by the U.S. Copyright Office late last year would mean terrestrial broadcasters that simulcast their over-the-air signals on the Web would incur copyright liability to the record companies.

The results of the copyright fee case and the related "Napster" case will affect how music is distributed over the Net.

Several major broadcast companies are re-evaluating their Internet policies.

See STREAMING page 5 ▶

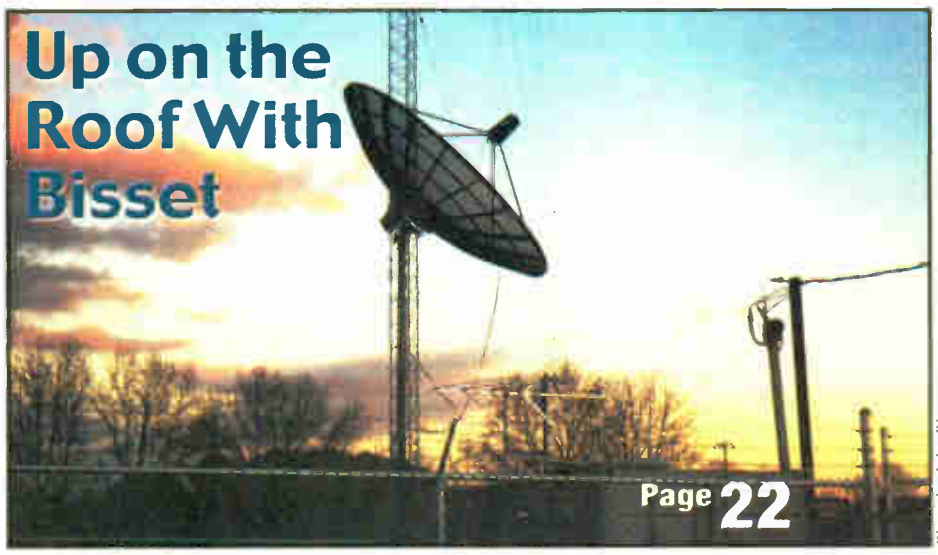


Photo by John Bisset

NEWS MAKER

Rudman On the Cutting Edge

by Steve Jess

LOS ANGELES In five years, Infinity Broadcasting Corp.'s news station KFWB(AM) will be pumping 50 kW into the Los Angeles basin instead of only 5 kW. Both analog and digital signals will be transmitted on its 980 kHz frequency, with ancillary data streams for weather, traffic and emergency information.

Also in five years, pagers, cell phones, Palm Pilots and perhaps even cable boxes might receive EAS messages, just like radios and televisions do now.

Richard Rudman

In five years, one man who is playing a role in these changes, Richard Rudman, will be enjoying the fruits of his labor in well-deserved retirement. Or not. He is having too much fun right now to think of quitting.

Rudman, 58, is director of engineering

See RUDMAN, page 3 ▶

◆ NEWSWATCH ◆

CEA Deplores Napster Ruling

ARLINGTON, Va. The Consumer Electronics Association hopes the so-called "Napster" ruling will be overturned. An appeals court said in February the music-trading service must stop trading in copyrighted material.

"Opponents should carry a heavy burden to show that a new technology is illegal," said CEA President and CEO Gary Shapiro. "This ruling ... could stymie technological development and sets a dangerous precedent for the preservation of fair use rights enjoyed by consumers for more than 20 years."

The same court in 1981 said the VCR was illegal before the Supreme Court overturned that ruling, Shapiro said.

He said the Napster ruling underscores the need for a new approach to intellectual property issues in the digital age. These issues are up for discussion at CEA's planned March 6 "Digital Download" conference in Washington.

Enco Will Sell Direct

FARMINGTON HILLS, Mich. Enco Systems Inc., a provider of digital audio delivery systems, will sell direct in the United States. The announcement ends the company's exclusive representation deal with the Harris Broadcast Communications Division.

This follows Enco's September announcement of the opening of a United Kingdom direct sales, support and manufacturing facility. Harris had been the exclusive global dealer for Enco Systems since early in 1999.

Director of Sales and Marketing Don Backus said, "We're putting together an exceptional team of people from across the country to help us continue to grow Enco Systems and help us gain even more market penetration."

FCC Fines Pirate $10,000

WASHINGTON The FCC has upheld a $10,000 fine against Richard Rowland for operating an unlicensed FM station from Longwood, Fla.

When notified of the fine last October,

See NEWSWATCH, page 7 ▶

Index

Polskie Radio Enters Digital Era

by Cesco van Gool

WARSAW, Poland Wandering through the Polskie Radio headquarters in Warsaw will never be the same.

No more journalists handing audiotapes to producers, no more archives piled high with tapes and no more tape-editing machines in every other room.

In 1998, Vice President Eugeniusz Smolar presented an ambitious plan to the Polskie Radio board: the digitization of all Polskie Radio programming and administrative departments before the end of 2002.

Polskie Radio put the project out for bid, which was won by Dalet and its Polish agent, PMC System Integrator.

The problems faced by managers of this job would be familiar to any U.S. radio managers involved in large consolidation projects and digital upgrades.The project also represents the largest installation of Dalet software in Poland.

New building

When completed, the project will include more than 200 workstations for the news, information and music departments, plus an additional 200 for administrative/sales staff.

By the end of 2000, the first phase was complete: the installation of a 30-workstation main newsroom now used around the clock by 70 journalists of Informacyjna Agencja Radiowa.

IAR provides the news and information services for three of the five Polskie Radio programs. The other two, PR1 Jedynka and PR3 Trójka, each have their own news department.

According to Wojciech Jurzyk, who leads the Dalet implementation group at Polskie Radio, the idea was that journalists should be able to access audio and text files from anywhere in the Polskie Radio network, including 17 regional stations which are connected to the system via a dedicated satellite connection and ISDN.

The network is installed in a new building next to the current Polskie Radio headquarters. The server farm is based on 15 Compaq servers running under Microsoft Windows NT and is divided into three major groups.

The system includes a main database and audio fileservers; application servers for searching, scheduling and so forth; and supplementary servers for audio-format conversion, Web publishing, backup and archiving.

The main servers are set up in a cluster configuration, so if one goes down the other takes responsibility with no downtime. This is the first cluster technology solution installed in a media business in Poland and one of the first Windows NT clusters running with a Sybase SQL database engine in Poland.

Dedicated networks

The workstations are Pentium III PCs with Digigram PCX11 and PCX80 audio boards.

In the newsroom, each workplace has one LCD monitor connected to two computers — one for Dalet5.1/TeamNews and a second for communications purposes, thus the newsroom network is separated physically from the outside world.

The network itself is a dedicated GigaEthernet with FastEthernet technology designed for broadcast sub networks and separate clients. The dedicated broadcast sub network includes Cisco and Cabletron elements.

The Dalet software consists of Dalet5.1, TeamNews, Interweb, the Dalet Web Portal and Netback.

Journalists should be able to access audio and text files from anywhere in the Polskie Radio network.

Dalet5.1 is used for acquiring, editing and broadcasting music or recorded audio over radio, the Internet, digital satellite and private broadcast networks. TeamNews handles news creation and management duties.

The Interweb facility lets remote staff preview and transfer stories and high-quality audio files via the Internet. The Dalet Web Portal allows the user to publish content on the Internet, and Netback provides backup capabilities.

All this is a big change from the Basys Unix-based text newsroom system Polskie Radio had used since the early 1990s.

"The biggest revolution is probably the fact that news journalists are now doing the whole production of their contributions — up to the actual broadcast — themselves," Jurzyk said.

The new system required a retraining of the staff.

Polskie Radio sent 12 people to the Dalet training center in Paris and, on their return, these people taught colleagues how to work the system — not always an easy task, as some journalists had never worked with computers.

But, according to Jurzyk, every day more of the Polskie Radio staff are convinced the installation is a big step forward.

Piotr Sek, president of PMC System Integrator, said, "It is great to see a 'traditional' journalist — one of the trainers — show his colleagues how he can prepare a full hour of news with text and integrated audio in 15 minutes and then broadcast it without the assistance of an engineer," he said. "The best part is to see the faces of colleagues afterwards."

Sek said previous installations included an eight-user system at Radio Aplauz in Wroclaw and a 40-user project for Radio Tok FM.

In February, the PMC System Integrator was finishing the implementation of a 12-user system for Radio dla Ciebie, the Polskie Radio regional station for Warsaw.

For Polskie Radio, PMC System Integrator also translated computer manuals and help files into Polish and created a few customized software modules. Those allow Polskie Radio to send the IAR signal over the dedicated Polskie Radio satellite network to the 17 regional stations.

PMC will customize the Web-publishing engine to be able to publish stories from the newsroom every few seconds to the Polskie Radio Web page.

The implementation of new technologies, however, sometimes can create unpleasant surprises.

Jurzyk cited an instance when the newsroom staff were preparing an item about the efforts to improve the chilled diplomatic relations between Poland and neighboring Belarus.

The report also included a recorded contribution from a Polskie Radio correspondent in Minsk, Belarus.

"Only minutes before airing the report, we found out we had queued up another contribution by the same reporter, filed earlier, about the plague of ever-increasing alcoholism in towns in Belarus. We were still able to correct it, but if we had aired it next to the diplomatic story, it could well have created a diplomatic scandal."

Rudman

▶ Continued from page 1

for KFWB, one of seven Infinity stations in the LA. area, and one of two that are all-news. (The other is KNX at 1070 kHz.)

"Southern California is a great place to live. It's on the cutting edge of technology." Rudman said. "It's on the cutting edge of grief, too."

'Busy' on all-news

Both aspects of southern California life keep Rudman busy at KFWB, which has been all-news since 1968.

"We have an extensive two-way radio system, which allows us to cover stories anywhere in the county. Reporters have cell phones and a lot of dedicated lines and receivers for two-ways. I like to think we are able to support reporters, who provide the information on breaking news," Rudman said.

"My core responsibility is to be a service department. I coined a phrase: 'When news breaks, we fix it.'"

Keeping everything working for KFWB's staff of more than 30 anchors and reporters may be a daunting task for Rudman and his staff of two technicians, but his workload has eased a bit since the Infinity era began in 1996.

Previously, Rudman was director of engineering for four stations. Now, each Infinity station in Los Angeles has its own director of engineering, each of whom answer to the corporation's west coast director of engineering, Scott Mason.

"Now ... I can devote 100 percent of my attention to KFWB," Rudman said.

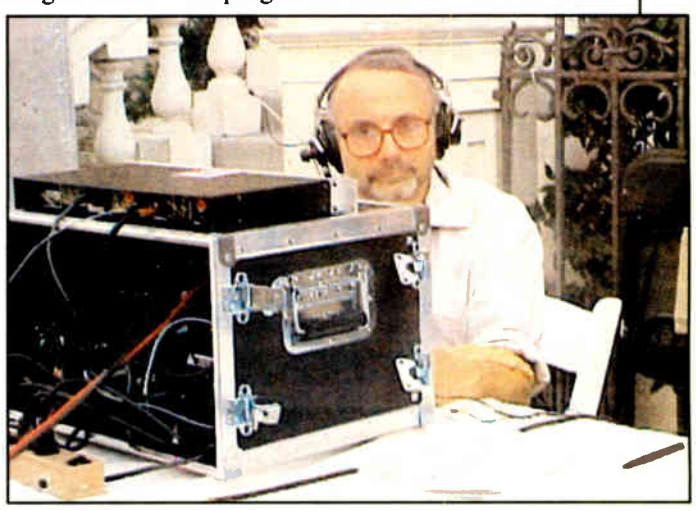
That means more than maintaining two-way radios and upgrading the computer network. KFWB conducts several major remote broadcasts each year. In recent months, the Democratic National Convention and the Golden Globe Awards were just two of the remotes Rudman oversaw.

For the Los Angeles Auto Show last June, KFWB relocated its entire afternoon anchor team to the convention hall, along with six terminals tied into the studio computer system through dial-up connections.

Consolidation has brought some advantages in Rudman's role as the one who recommends equipment purchases.

"There are many benefits if you can get together as a group and make a decision about a certain piece of equipment," Rudman said. "There's the obvious price advantage because you can negotiate a group discount. If there are problems with the equipment, you also have more control over the situation."

As before, corporate policy requires at least three bids from different suppliers on major purchases.



Rudman takes a break during a remote on the Paramount Pictures lot in Hollywood last fall.

Growing the station

When he's not busy with equipment maintenance or remote broadcasts, Rudman has plenty of other projects on his "to-do" list, including the construction permit application for KFWB's planned upgrade from 5 kW, non-directional, to 50 kW, directional. It's a project that has been on the drawing board since Westinghouse bought KFWB in 1966.

Why now? "L.A. County is growing horizontally," Rudman said. "KFWB has to grow with it."

Rudman's influence does not stop at the edge of the Los Angeles basin.

At the time he was interviewed, he was preparing for a February meeting in Washington, D.C., of the EAS National Advisory Committee, which he chairs.

Rudman sees the committee's role as helping local broadcasters and emergency managers form the partnerships that make EAS most effective.

"We're looking at identifying success stories and best practices and getting that information out on list servers and publications, to let people know where things are not working out so well."

Rudman said, "You need to identify

See RUDMAN, page 8 ▶

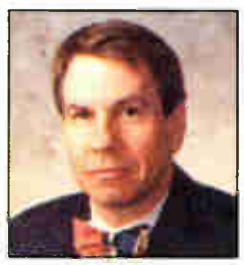
FROM THE EDITOR

NAB Engineering Power Panel


Al Kenyon


Margaret Bryant


Tony Masiello


Frank McCoy


Tom McGinley

What could be better than sitting around chatting with your fellow radio engineers?

Last fall I invited you to a session at the fall NAB Radio Show, a summit meeting of some of the top tech people in radio. That session turned out to be among the most popular in the engineering conference.

The association has kindly asked me to host another at the upcoming NAB2001 convention in Las Vegas. You won't want to miss it — in fact, be sure to arrive on Saturday so you can catch this one on Sunday morning.

Our premier panel last fall was a big hit. Front, from left: Frank McCoy, Barry Thomas and Ted Nahil; rear, yours truly, with Andy Butler, Jeff Littlejohn, Charlie Morgan and Mike Starling.

The session is called the "Radio Engineering Roundtable," set for April 22 from 9:30 to 11 a.m. in the Las Vegas Convention Center.

This is what I call a cracker barrel session. It's different than most others on the agenda. There are no white papers, PowerPoint presentations or speeches from notes.

Instead, I've asked five of the most successful engineering managers in the country to sit and chat with us about what they do and how they handle the pressing demands of their jobs. I'll ask questions — about their current buildouts, managing a large group of facilities, the challenges of keeping good talent, their predictions for Internet radio, satellite radio and IBOC, and more.

It's informal, it's fun ... and you get to ask questions, too. In fact my favorite part of the fall panel were the questions from the audience. Many leading group engineers turned out to listen to their colleagues, including several members of the National Radio Systems Committee; and the give-and-take was highly informative.

This year's panel is distinguished indeed.

Al Kenyon is vice president of projects and technology for Clear Channel Radio. Tony Masiello is vice president of operations at XM Satellite Radio. Tom McGinley is director of engineering for Infinity Broadcasting's Seattle stations and long-time technical consultant to RW. Margaret Bryant is director of engineering and technical operations for ABC Radio Networks. And Frank McCoy, returning from our fall panel, is vice president of engineering for American Media Services.

We trimmed the length of the session a bit to fit your busy schedule. Bonus: The NAB program calls for our session to be held in Room N249 of the LVCC. After our panel, you can just stay put for the next event in that room, "DAB Global Perspectives," moderated by Milford Smith of Greater Media, to find out what's going on in the world of digital radio here and abroad.

So please come out and take part. I guarantee you'll enjoy it.

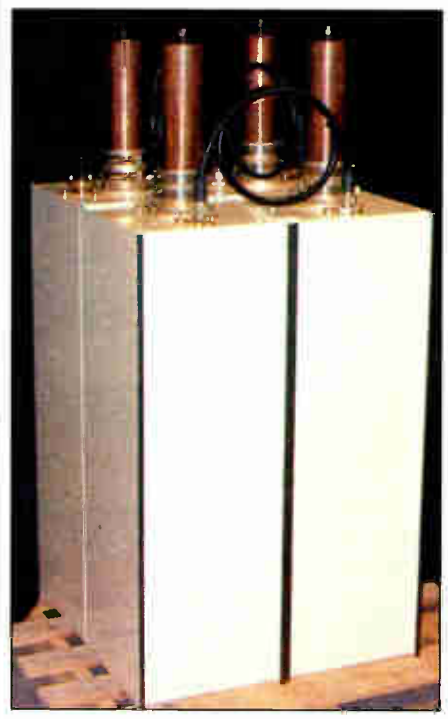
— Paul J. McLane

Are you ready for IBOC? Tim Singleton is.

He is the winner of a gift certificate from Shively worth $15,000 — that's right, 15 grand — to buy an IBOC FM filter/injector system.

When radio goes digital in the next couple of years, every FM station that installs IBOC will need similar cross-coupling hardware to inject the IBOC signal into its analog transmission system.

Suitable for a full Class C facility, the Shively system can be customized for higher power levels. The size and weight of this particular product are notable: at 2 feet square by 4 feet tall and only 110 pounds, it's easy to install and manage. No AC power is required for operation. Shively says this product is already seeing use in iBiquity Digital test IBOC installations and will shortly be certified by iBiquity.


Shively IBOC FM Filter/Injector System

The injector, not shown, attaches to the side of the IBOC filter and is rated for use with a 30 kW analog transmitter.

Tim Singleton is station manager of WEKU(FM) at Eastern Kentucky University in Richmond, Ky.

Thanks to our friends at Shively for this prize. Have you signed up yet for our 25th Anniversary Silver Sweepstakes? Visit *www.rwonline.com*

Streaming

▶ Continued from page 1

according to observers. Some managers are worried about retroactive fees tied to streaming; and some industry participants are using doomsday wording to describe the possible impact of these developments on Net radio.

Some smaller station owners, on the advice of their attorneys, have already stopped streaming or have delayed plans to launch Net broadcasts.

Arbitration to determine streaming royalty fees is scheduled to begin this July. Broadcasters could possibly incur copyright liability retroactive to 1998.

NAB suit

In response to the December ruling by the Copyright Office, the NAB filed suit in U.S. District Court in Philadelphia in January seeking to overturn the decision. Bonneville International, Cox Radio, Emmis Communications, Entercom Communications, Infinity Broadcasting and Susquehanna Radio joined NAB in the suit.

The NAB withdrew a previous lawsuit in U.S. District Court in New York against the Recording Industry Association of America. Dennis Wharton, senior vice president of NAB communications, said the New York lawsuit was filed before the Copyright Office made its declaration.

"Once we had the decision by the Copyright Office, we directed our attention there," he said. The New York lawsuit sought a declaratory ruling that radio stations that stream audio would not be subject to copyright liability.

The performance copyright sought by the record companies would be charged in addition to composer fees already paid by broadcasters for any audio streamed.

I could envision broadcasters abandoning the idea of streaming their audio onto the Internet.

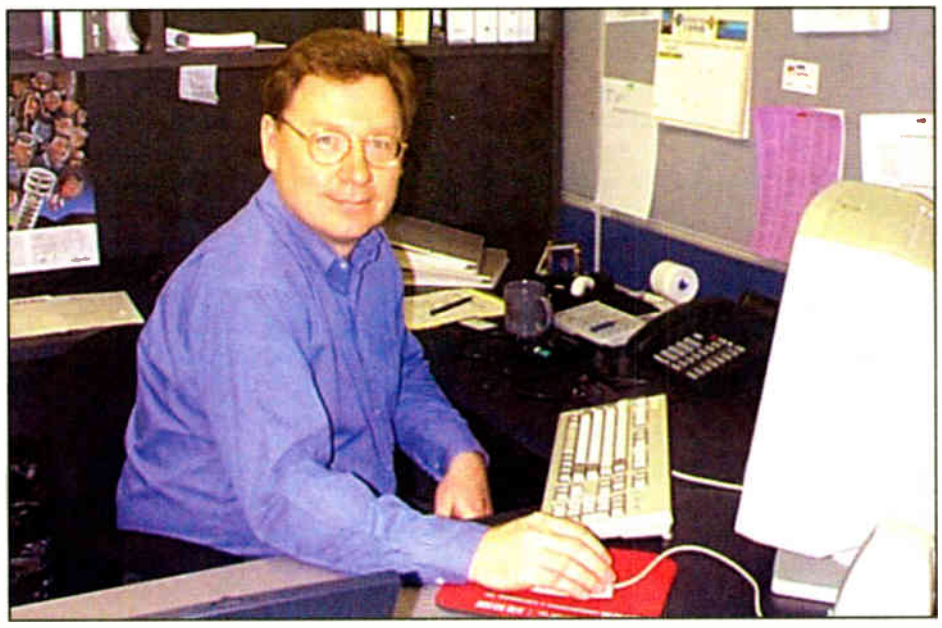
— Keith Meehan
RMLC

Broadcasters have not directly compensated the performers of the music the stations play. Radio stations generally argue that they should not be obliged to do so, because they give record companies free promotion by playing their content.

Wharton pointed to a series of congressional hearings in the mid-1980s in which lawmakers decided broadcasters generate millions of dollars in record sales by playing music. The exemption was reaffirmed in the 1995 Digital Performance Rights and Sound Recordings Act.

The NAB argues that broadcasters' exemption from these performance fee royalties extends beyond traditional broadcasts and should include Internet simulcasts of terrestrial broadcasts. It contends in its suit that "since these over-the-air broadcasts are not re-packaged" in any way, the exemption remains in effect.

According to the NAB, radio stations pay songwriters and copyright holders of compositions nearly $350 million a year through Broadcast Music Inc., American Society of Composers, Authors and Publishers and SESAC.



Criss Onan of RCS

The RIAA took the first step in collecting royalties when it filed a Petition for Rulemaking with the Copyright Office in March 2000. It asked that the office "adopt a rule stating that a broadcaster's transmission of a radio station over the Internet is not exempt from copyright liability."

The record company's assault on Napster and the recordable MP3 format has received more media attention. But the recording industry is no longer concerned just about computer-literate college kids downloading free music; it's also broadcasters who stream audio.

By their actions, both broadcasters and the recording industry realize what is at stake — potentially millions of dollars in royalties if streaming over the Internet becomes profitable for radio stations.

Hilary Rosen, president of the RIAA, responded to the Copyright Office ruling on RIAA's Internet Web site stating, "This is an important right for artists and record companies. We look forward to working with the broadcasters for a smooth transition into this marketplace."

On the other side of the issue, Wharton said NAB believes that Congress never intended broadcasters to be subject to performance fees in either the analog or digital world.

"We think the ruling is simply an incorrect interpretation of the law. In addition, the record companies want to attach this liability to a technology that is not making any money. It could kill the Internet audio streaming business for broadcasters," Wharton said.

Wharton is referring to the 1998 Digital Millennium Copyright Act, which, observers say, brings the radio industry to the threshold of owing the recording industry millions in royalty payments.

The DMCA calls for anyone streaming audio over the Internet to pay performance fees to record companies for the music they use, possibly retroactively to October 1998. Those fees have not been established. Industry executives said the fees are likely to fall in the 5 to 10 percent range of Web site gross revenue. A flat fee could also be established for non-revenue producing Websites.

The DMCA makes one thing certain — Internet-only Webcasters will have to pay.

Jonathon Potter, executive director of the Digital Media Association (DiMA), wrote in a letter made public that he expects the fees could be as high as 15 percent of revenue from a Web site.

DiMA is comprised of more than 50 companies that develop and deploy technologies to perform, promote and market content over the Internet and other digital networks.

David Oxenford, a partner with Shaw Pittman, which represents a number of state broadcast associations, said the fact that no "play and pay" fee has been set is the biggest wild card for broadcasters and is what has station executives nervous.

Some early adopters now fear they could be penalized for their initiative; others who held off on a major Net presence now look prescient, at least for the moment.

Arbitration this summer

Several major broadcast groups will participate in the Copyright Office arbitration proceedings, including Clear Channel Communications, Cox Radio and Emmis Communications.

"Throughout the process, the arbitration panel will hear testimony from all sides and then try to determine the value of music being streamed over the Net," Oxenford said. The panel can take up to 180 days to reach a result, meaning it could be early 2002 before fees are determined.

The Copyright Office has indicated that it prefers to have the broadcaster liability issue settled prior to the arbitration hearing. If broadcasters lose their lawsuit against the Copyright Office, Oxenford said the result would be immediate.

"If broadcasters have to pay for music on their Web sites, and they're not making any money off their Web sites, I believe most would discontinue the practice. The real potential is there to scare broadcasters away from the Internet," Oxenford said.

Gary Fries, president of the Radio Advertising Bureau, believes a great deal

See STREAMING, page 6 ▶

Streaming

▶ Continued from page 5

of potential advertising revenue could be lost if radio stations decide to pull back on their Web efforts. He said the record industry might hurt itself in the long run by pursuing the performance fees now.

"It's not a developed revenue stream yet. No cash flow is coming out of many of the broadcaster's Web sites. It would have been better to wait until the technology was developed. I think that way (broadcasters) would have been more willing to listen," Fries said.

'Disaster'

Keith Meehan, executive director of the Radio Music Licensing Committee, said if broadcasters were made to pay the additional fee for streaming, it would be a "disaster" for the industry.

"It's a terrible development for everybody, for the development of the Internet and for broadcasters," Meehan said. "I could envision broadcasters abandoning the idea of streaming their audio onto the Net."

The RMLC is an association formed by broadcasters to represent them in negotiations with ASCAP and BMI to determine fees owed to the copyright holders of compositions. The group represents more than 5,000 radio stations, including Clear Channel, Infinity and Emmis stations.

Meehan said most of his members' groups pay between 1 and 2 percent of gross revenue to ASCAP and BMI.

"So the performance fees RIAA is talking about collecting are much greater than that."

Industry executives had varied reactions to the streaming royalty fight.

"The record industry would be crazy to push this to the point where broadcasters would no longer stream music and make a profit," said Jeff Smulyan, president and chief executive officer of Emmis Communications.

"I'd be very surprised if it comes to the point where we would have to stop streaming altogether, but if the rates were so onerous, we'd consider it."

Bill Croghan, chief engineer for KOMP(FM) and KXPT(FM) in Las Vegas, said Lotus Broadcasting plans to stop streaming audio of the two stations if forced to pay performance royalties. "We don't think it's worth paying any more to the record companies to have the coverage," Croghan said.

One broadcast company that is not worried about owing past royalties to record companies is Infinity Broadcasting. Company policy prohibits any of the company's 181 stations from streaming audio.

"But, it isn't because we have been fearful of the potential royalties and liability," said Gil Schwartz, Infinity spokesman. "We haven't figured out yet an economic model by which money can be made by streaming audio over the Internet."

Infinity's conservative approach to the Internet has been the focus of much debate over the past several years, but some industry observers now say Infinity President, Chairman and Chief Executive Officer Mel Karmazin's go-slow approach looks wise in light of the rights issue.

Infinity stations use their Web sites as marketing and awareness tools, Schwartz said.

Stop streaming?

Greg James, Bonneville vice president of technology, said the company has not stopped Webcasting any of its stations.

"If the fees are prohibitive, though, we would stop audio streaming. If this is based on agreed upon fees and we can still be profitable with the Net, then we would continue to invest in the technology," he said.

Citadel Communications Corp. is streaming about 90 percent of its radio stations. And according to a company spokesman, Citadel will continue to Webcast no matter what the royalty fee is.

"If anything we are still moving more into the Internet and streaming. We have found some successful business models," said William Perrault, Citadel vice president for new media. "Our primary streaming partner Coollink Broadcast Network has ad insertion up and running successfully on our terrestrial radio stations. We think it will be profitable."

Smulyan does not rule out the possibility of a negotiated settlement with the RIAA. "I'm optimistic that we'll have a favorable outcome to our lawsuit. However, I'd be satisfied with some form of fair agreement with the other side," he said.

Any decision by stations to limit their Web presence could also have a drastic affect on companies in the broadcast streaming business.

RCS sells software to stream audio and allow for ad insertion on the Internet. Criss Onan, RCS Enterprises sales manager, predicted that if terrestrial broadcasters must pay the fees, stations initially might cut back on their Internet streaming. However, advertising revenue should grow to offset the licensing expenses as the Internet attracts more listeners, he said.

"The potential by terrestrial stations to offer 'side' genre channels and for them to produce revenue to augment their main market channel is very exciting," Onan said. "In some ways this has been a wake-up call to terrestrial stations to formulate an Internet strategy. In the past, many (stations) simply allowed aggregators to stream their signal as long as the cost was low." An aggregator is a third party that streams the station's audio at little to no cost.

Activate Corp. is a streaming services provider. Senior Vice President of Marketing Steward Chapin said the whole matter will depend on what formula the arbitration process determines will be used to set fees.

"If it's tied to audience size or some other formula related to the Webcast audience, and it's a reasonable number, then it's possible," Chapin said. "If it is tied to the size of a broadcaster's over-the-air audience, then I'll bet broadcasters stop simulcasting their over-the-air

See STREAMING, page 7 ▶

◆ NEWSWATCH ◆

▶ Continued from page 2

Rowland said the director of the FCC's Tampa field office must register his "Fiduciary Tax Return" and "Fiduciary Tax Estimate" with the State of Florida before he could prove "any financial liability" against Rowland.

Later, Rowland submitted copies of state constitutions, the Magna Carta, the Mayflower Compact and his birth certificate.

"Our review of the documents revealed nothing responsive to the facts" of the case, stated Enforcement Bureau Chief David Solomon in a February order upholding the penalty. "Nothing in the documents persuades us to reduce the $10,000 forfeiture."

Rowland had 30 days to pay the fine.

ARMA to Meet In Maryland

MALVERN, Pa. The American Radio Manufacturers Association will hold its ARMA 2001 show June 3-5 at the Hilton Hotel in Columbia, Md. The regional convention was held in Atlantic City and Baltimore in the past several years, and attracted engineers and managers from the Middle Atlantic states from Connecticut to Virginia. Organizers hope that the new location will help draw more people from the Washington area nearby.

For information contact Robin or Vince Fiola via e-mail to *arma@studiotechnology.com*

BIA: TC Act Great for Radio

CHANTILLY, Va. BIAfn officials say the '96 Telecom Act has been great for radio in terms of efficiencies gained from facility consolidation and more ad revenue.In 2000, station trading increased to 1,749 stations sold for $24 billion. That's compared to 1995, when 1,259 stations were sold for $5.4 billion. Due to the increased efficiency resulting from consolidation, radio advertising dollars swelled to $20 billion, for a total market share of 8 percent, said BIAfn.

BIAfn VP Mark Fratrik believes the data shows that deregulation helped the industry. However, he doubts that future acquisitions will be as significant, given the crest of consolidations appears to have passed.

Streaming

▶ Continued from page 6

product completely."

While this debate plays out, online listenership is up. An Arbitron/Edison Media Research study released in February showed that 13 percent of Americans, more than 30 million, use Internet audio or video each month, compared to10 percent a year ago.

The report also found that broadband and streaming media go hand in hand.

"As more consumers get super-fast Internet access at home, their streaming media consumption is likely to grow," said Bill Rose, vice president and general manager, Arbitron Internet Information.

Two-thirds of the study's respondents who listen online would be upset if radio stations discontinued Webcasts because of new government regulation, the study concluded.

Most experts believe it will be apparent early next year if radio stations will be able to help meet the increasing consumer demand for online material.

Corrections

In the Dec. 6, 2000 issue, we omitted the first names of several people quoted in our CFA/EH antenna story. Here are the full names: Tom Silliman, president of ERI; John Stanley, educator and consulting engineer; James Hatfield, a principal in Hatfield & Dawson; Ronald Rackley, duTreil, Lundin & Rackley and Ben Dawson, a principal in Hatfield & Dawson.

In the Nov. 22, 2000 issue (*Newswatch*) we reported on the FCC's case against Alan Fried over an unlicensed station. His attorney, Scott Bullock of the Institute for Justice, filed a petition with the Supreme Court asking the court's help in "vindicating" Fried's rights to free speech. The Supreme Court was not being asked to rule on the merits of the case as the article may have suggested, rather the Court was asked to consider a technical issue. Fried was not fined for operating an unlicensed station, as RW originally reported.

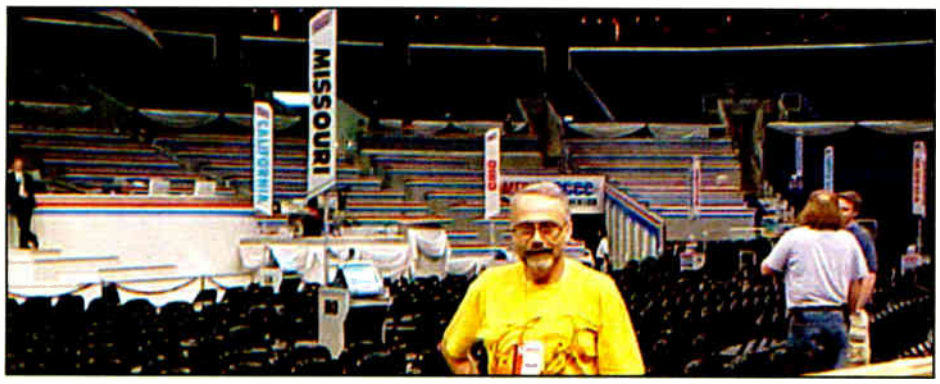
RW regrets the errors.

Rudman

▶ Continued from page 3

emergency management people and get to know them. Once you get to know them, you may be able to teach them to look on broadcasting as a better resource to tell the story. They get a chance to teach you Emergency Management 101, so you each meet your goals."

Rudman wants local broadcasters to work with emergency managers to integrate emergency public information into management. He said a common problem during emergencies is that the public information officers are the same people who handle media relations for police and fire departments, and they do things the same way.



Richard Rudman is shown during setup at the Democratic National Convention in Los Angeles last summer.

However, during a major emergency, reporters may not have the opportunity to follow up with additional questions as they would on a routine story. Rudman said PIOs need to anticipate this and ask their sources the follow-up questions that reporters would ask. By being pro-active, he said, PIOs can reduce miscommunication and help reporters get the whole story.

An E-Chip?

One of the NAC's subcommittees is studying advanced warning systems. Rudman sees Personal Digital Assistants, such as the Palm Pilot, as potential EAS devices, along with pagers and even set-top boxes distributed by cable companies.

Rudman said he stole an idea from the promoters of the V-Chip in TV sets.

"I think what we need for EAS is an E-Chip, which would be able to embed recognition of EAS protocols in personal communication devices." He sees a day when someone's cable box could alert that individual of an approaching storm, even if the television is turned off.

Rudman sees this happening through industry acceptance of EAS, rather than a mandate from the FCC.

He also wants to make sure EAS is not used in cases where there is a better alternative. One such case is in Texas, where broadcasters are debating whether to use EAS for so-called AMBER alerts for missing children.

Rudman points to the State of California's EDIS, the Emergency Digital Information Service, as an example of a better alternative. Rudman describes it as a government-to-media wire service, which any law enforcement agency in the state can use to disseminate vital information, including bulletins, images and even audio clips. EDIS began in 1990 using ham-radio packet technology, and is now a Web-based application (*http:\\edis.oes.ca.gov*).

Packet technology is early digital wireless communications via amateur radio where a computer terminal drives a ham transmitter with the text data modulating the signal in the form of data packets. The technology was developed in the '60s and is still popular with some in the ham community.

EAS, said Rudman, is ideal for short warnings that run 30 to 40 seconds at most.

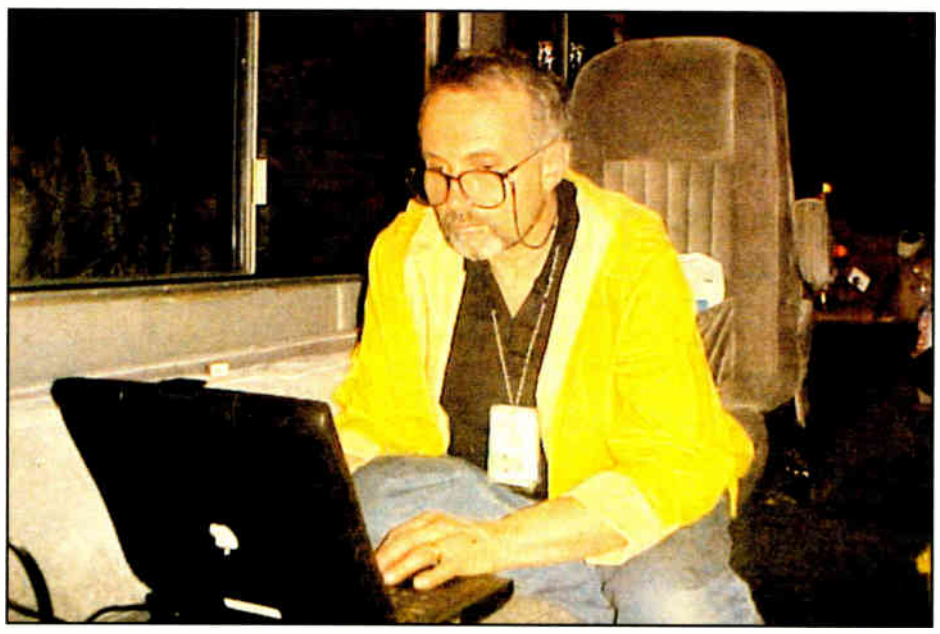
The detailed information in a missing child alert is better suited for a system such as EDIS. But, he said, local broadcasters and emergency managers must make the final decision.

Internet strength

"We don't feel it's our role on the advisory committee to tell people what to do," he said.

Emergency information also is a large part of KFWB's presence on the Internet (*www.kfwb.com*). He said the strength of a good Web site is that it complements a station's on-air programming, and that's what KFWB's site is designed to do.

Besides the usual update on stories, traffic and weather, it features a set of earthquake and disaster-related links (click on the: "Quake Center" button).



Rudman checks e-mail in the KFWB(AM) remote studio.

Besides being a way to reach listeners, Rudman said the Internet has become a valuable resource for reporters. Every workstation in the KFWB newsroom now has Internet access.

Rudman knew he wanted to work in radio since he was growing up near Boston, listening to Westinghouse-owned WBZ, which was a "full-service" station.

"I remember my mom taking me to WBZ to pick up her prize after she had won a contest," he said. He even toured the station with his Cub Scout troop. "I think in the back of my mind I always wanted to work for WBZ."

In college at Northeastern University in the mid-1960s, Rudman joined the ham radio club, and eventually became the chief engineer of the college's new carrier-current station. He applied for a summer relief job as an engineer at WBZ, and was hired even though he didn't have the FCC First Class license, which was required at the time.

"Chief Engineer Don Parker told me, 'You've got the job, but you have to take the test first before I can hire you.'" Rudman took the test, passed it and got the job.

One of his mentors at WBZ was transmitter engineer Fred Osgood, who needed 20 minutes to take all the meter readings on the station's behemoth Western Electric 50HG transmitter.

"It was the size of 10 Harris DX50s, with power and modulation transformers outside the building," Rudman said.

After working three summers at WBZ, Rudman was hired full-time in the fall of 1968. Some of his duties were not strictly technical.

"I wound up (engineering) Bruins and Celtics games at the Boston Garden with announcer Johnny Most. Johnny would sometimes fall asleep during breaks. My job was to make sure he was awake when the break ended."

Short, cheap tower

In early 1971, Rudman moved to Tucson to build an FM station owned by WBZ Chief Engineer Norm Graham. Because there was almost no budget, "Norm wanted a short tower, to avoid painting and lighting requirements. The lower rung of the six-bay antenna was not very far from the ground. I'll always remember it for one reason: Whenever the transmitter was on, the bathroom light never went out."

After Tucson came two and half years working for KGB-AM-FM in San Diego, and in April of 1975, he rejoined the Group W family when he was hired at KFWB.

Rudman's task then was much like his current role.

"My first mission was to rebuild KFWB at the old location," he said. But upon inspection he found the building was structurally flawed.

"I recommended a move to the new location." Rudman's caution was proved right in 1994, when KFWB's former building was damaged in the Northridge earthquake. The site is now a vacant lot.

Today, Rudman is planning a different kind of move for KFWB, the move from analog to digital transmission. IBOC is a technology to which Infinity appears committed, as an investor of iBiquity Digital Corp. Rudman believes if IBOC is marketed correctly, it will succeed.

"It's my responsibility to suggest ways we can use IBOC at KFWB. I'm aware there are serious industry doubts IBOC is a viable technology. I'm optimistic that it will be," he said.

Rudman foresees KFWB using IBOC to transmit data along with its audio programming.

"That might involve displaying headlines, emergency information, traffic information, maybe even printing out information for people when they're away from the radio. We want people to come back to KFWB two to four times a day. IBOC helps ensure that."

But because of its inherent coding and decoding delay, IBOC also poses a challenge to a station that prides itself on doing live news reports from the field.

"AM and FM broadcasters who are going live are going to have to figure out a way to do IFB (interruptible fold-back) because reporters are not going to be able to listen to the off-air signal," Rudman said.

"The FCC is going to have to realize that broadcasters are going to need more Part 74 'back-stage' frequencies. We're going to face a serious challenge in doing real-time broadcasting," said Rudman.

Rudman will have 30 years of service with the company next year.

Richard Rudman Stats

Resides: Hollywood, Calif.

Born: June 15, 1942, Boston

Career: Director of engineering, KFWB(AM), Los Angeles, Infinity Broadcasting Corp., 1975 to present. Chief engineer, KGB(AM-FM), Brown Broadcasting Inc., 1972-1975. Chief engineer KAYN(FM), Tucson, Ariz., Graham Broadcasting, 1971-72. Engineer, WBZ(AM), Boston, Westinghouse, 1966-1971.

Professional: Chairman, National Advisory Committee for the Emergency Alert System. Founding chairman, Southern California Frequency Coordinating Committee, 1976. National president, Society of Broadcast Engineers 1985-87. CPBE and a fellow of the Society. Member, SBE EAS Committee. Member, SBE FCC Liaison Committee. Los Angeles County EAS LECC Chair. California EAS SECC vice chair. Executive board member/treasurer for the Business and Industry Council for Emergency Planning and Preparedness.

Author: The first chapter on Part 74 frequency coordination for the 7th Edition of the NAB Engineering Handbook and the first chapter on broadcast facility disaster preparedness and recovery for the 8th Edition.

Amateur Radio Call Sign: W6TIA

Personal: Married

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Digital Success Story at WRBS(FM)

A Major-Market Christian Radio Station Takes The Digital Path, Upgrades Studios in Baltimore

Ty Ford

The two and a half years spent working out the details that would culminate in the complete digital conversion of the studio complex at WRBS(FM) in Baltimore could serve as a blueprint for other stations headed for this goal.

To be sure, the path was not always clear or evident.

According to Station Manager Steve Lawhon, the conversion was more challenging because WRBS chose to change everything from the walls out, including a redesign of the main studio. The goal was to bring the facility to the leading edge of technology for the ease and efficiency of its operators, and to recreate a plant that would make the WRBS air sound more consistent and efficient.

"We have over 30 different organizations that provide audio to us," he said. "That equals hundreds of different sources that find their way into our audio chain. We're not just leasing time. Our programming becomes an extension of us and we work in partnership with our program suppliers to achieve that.

"Of course, programming is about the tools and the people behind the tools. With this project, our Chief Engineer, Peter Allen, has done a lot of very good work to give us new tools."

Inspiring studios

WRBS is a 50 kW station operating in Baltimore at 95.1 MHz, with translators in Camden/Dover, Del., Salisbury, Md., and Hanover, Pa. Listeners can also hear it at *www.wrbs.com*

The station, owned by Peter & John Radio Fellowship Inc. since 1964, plays inspirational and contemporary Christian music and programs.

Allen said he performed the previous studio rebuild more than 15 years ago, before the need for CD players and studio computers.

Since then, the station has acquired a number of digital audio devices for the air chain and production studios.

The WRBS Control Room is seen here from the guest position.

"We needed a control room that had, at its heart, a hard-drive-based digital audio 'store and forward' system that could tie it all together. We found that solution in the Broadcast Electronics AudioVault."

Allen said the first problem he ran into was that the digital on-air boards were boasting more than they could deliver.

"We kept hearing promises about hardware. They turned out to be nothing more than vaporware, until we came across Klotz Digital, which delivered more than we were looking for. In addition to having the right stuff in their digital boards, they had refined the art of audio routing in their consoles."

Allen said the Vadis DC-12 turned out to be the best interface, providing a platform to bring together the varied components of the control room.

The DC-12 can be programmed so each operator can customize his or her control surface. Allen was discovering the power of the digital format.

"When I first saw the Klotz Vadis DC-12 console, most of the buttons were unmarked. I asked, 'What do these buttons do?' They answered, 'What do you want them to do?' Here was a totally programmable, routable digital audio console with following logic and tallies and it got me hooked."

and production studios. WRBS integrated six hubs, four patchbays, a distribution amp and seven self-powered headphone amps into the new system.

"Using the shielded CAT-5 patchcords with prefabbed dongles to connect the equipment to the Klotz frames was simple," he said. "Each hub and patchbay are equipped with both RJ45 connectors and 110 punch blocks for easy connection."

Allen also installed a fiber-optic link between the Vadis Frames in the AudioVault room and equipment room, saving more copper.

Another advantage to waiting a few years for the technology to mature was that flat-panel monitors became affordable. Allen likes them because they take up less space and generate less heat and noise. Devices that do generate heat and noise have been sequestered into a specially-equipped computer room utilizing Cybex Longlines and Switchview controls to keep the CPUs and frames clean and cool.

Equipment Room/Producer's Office Looking Into Control Room

Originally, Allen said, the staff was looking for a 36-to-48-channel console, and trying to figure out how to make it fit in the studio.

"With the Vadis DC-12, we found the fully routable 12-channel console could do it all, and at a better price. So now, when we go from morning drive to midday programming, one push of a button reconfigures the board in less than a second. And, at any time, any input can be assigned to any fader in less than 3 seconds. It took less than 10 minutes to show our operators how to run it."

Around the hub

Allen says he chose Radio Systems StudioHub equipment, which uses computer-style RJ45 connectors and shielded CAT-5 cables to provide interconnectivity between the control room, news booth

The station's music, satellite programs, commercials and promos are stored in the AudioVault as uncompressed files.

While he admits it takes longer to transfer files on the fully mirrored and backed-up servers, Allen states, "Most of our programs come to us already compressed via satellite. With the cost of hard drives declining, it makes sense to avoid additional compression and the resulting cascading algorithms that can make digital sound bad."

See WRBS, page 20 ▶

SONY

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MZ-B50 MiniDisc Portable Recorder/Player • This recorder means business, combining the excellent sound quality of digital technology with the portable size and convenience of the MiniDisc format. It's the perfect recorder to take on the road for on-location interviews and remote news coverage. Features include a built-in stereo microphone and speaker, remote control index marking for quick search, Voice Operated Recording (VOR) and a long recording time of up to 148 minutes in mono.

MDS-B5 MiniDisc Recorder/Player • This half rack model is for professional use, maximizing the advantages of MD media, ATRAC and memory technology. The Direct Duplication Link allows you to make a complete copy, including text at 4x speed, and the RAM-TOC Edit lets you decide whether or not to save your edited recording. Hot Start up to 10 tracks and select the next track for playback while listening to the current selection. It's an MD must-have for any radio station.

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www.sony.com/proaudio

MiniDisc

Mobile Technologies: How to Cope?

Tom Vernon

With commuting times and traffic congestion on the increase in most urban areas, the time that we spend in automobiles becomes more important.

Radio has long been an important ally in making the ride home more bearable. In fact, the Consumer Electronics Association says that 75 percent of our in-car listening is done to AM or FM, as opposed to CDs or other media.

But radio's listening time may soon decrease, as alternative mobile entertainment choices compete for commuters' ears.

Cassette and CD players have long been available. Now they are being joined by mobile MP3 devices and, soon, satellite digital radio receivers.

As reported in the Feb. 14 issue of RW, the 2001 International Consumer Electronics Show highlighted innovative devices aimed at consumers in the car listening environment.

Have broadcasters taken the mobile audience for granted? If so, what should they do now?

Listen up

While there are no sure-fire strategies to combat these potential incursions, some industry leaders have begin to think seriously about the problem.

John Caracciolo, vice president and general manager of Long Island's WLIR-AM-FM, notes that broadcasters often are too slow in their response to new technologies.

Radio stations that put their heads in the sand are going to get buried.

— John Caracciolo

"Radio stations that put their heads in the sand are going to get buried. One strategy to respond to MP3 car stereos and satellite broadcasting is localism," he said. "This means not only paying more attention to local news, but also giving exposure to local music and local musicians."

Becoming a provider of unique MP3 content may be a way for stations to capture some of the mobile MP3 audience. Localized versions of hit songs, material by local artists and special programming all may be served to the listener through the station's Web site.

Creative uses of the RDS subcarrier are also a possibility, although RDS has not been a sweeping success in the United States.

But the hardware is out there. For instance, Jay Brentlinger, president of Circuit Research Labs, said his company includes Radio Data System capability in the digital software of CRL and Orban products. He said the alternate frequency function of RDS, which can switch the receiver to a station's translators, and the traffic alert function, which activates the receiver for traffic bulletins, can be used to promote drive-time listening.

Also, billboards that display a station's current song and artist can be effective promotions to grab a mobile audience, although anecdotal evidence suggests that the RDS billboard strategy has enjoyed only spotty successes since the early days of RDS.

No pickets

Long-term technical strategies to combat audience erosion also may need to be considered.

FM stereo reception is still plagued by multipath interference, particularly in urban areas. Eric Small, CEO of Modulation Sciences Inc., said one proven solution to the problem is diversity reception, in which two antennas are used; the receiver automatically selects the one with the best signal.

The technique, common in wireless microphone systems, could also be applied more widely to radio receivers.

"Diversity reception has been used in the European mobile market for the past 10 years, and the improvement in reception is staggering," Small said.

"Some would object to the aesthetics of two antennas, but auto manufacturers have been pretty clever about hiding the second aerial."

New consumer electronics devices have always been a part of radio's competitive environment. This year's batch, as seen at the CES show, is dominated by MP3 players and preproduction satellite digital radio receivers. Major consumer manufacturers are battling to win the ears of listeners on the move.

For instance, Delphi demonstrated new technologies that it hopes will make mobile MP3 players easier to use.

Conventional units require that the user burn CDs with MP3 files, or remove the player from the car and download files from a home computer. But by using the wireless local area network standard IEEE 802.11b, licensed audio files and other data could be transmitted at speeds of up to 11 MB over a range of 300 feet.

A collaborative project of Delphi and 3Com Corp., the prototype network operates in the 2.4 GHz band.

Delphi Delco Electronics also will be shipping XM and Sirius Satellite Radio receivers to various automakers.

Glitch-free

Another example is Empeg, one of the first companies to manufacture MP3 car radios. It recently was acquired by Rio. The second-generation Empeg car player uses laptop hard drives as its storage medium. These ruggedized drives, combined with sophisticated caching, promise glitch-free listening even on rough terrain.

For loading new music, the player pulls out of its sled and connects to a home computer via USB or Ethernet connectors. The player works with either Windows or Linux software.

Empeg will soon support Windows Media Audio (WMA), which has smaller audio files, enabling more songs to be stored on the hard drive. Another benefit to the removable receiver is that you can connect it to your home stereo and continue listening where you left off in the car.

The Empeg box runs on the Linux operating system. Computer-savvy users can customize the player to their tastes, and add other Linux applications.

The entry-level model has 6 GB of storage, providing 100 hours of music. The 40 GB model holds more than 680 hours of music.

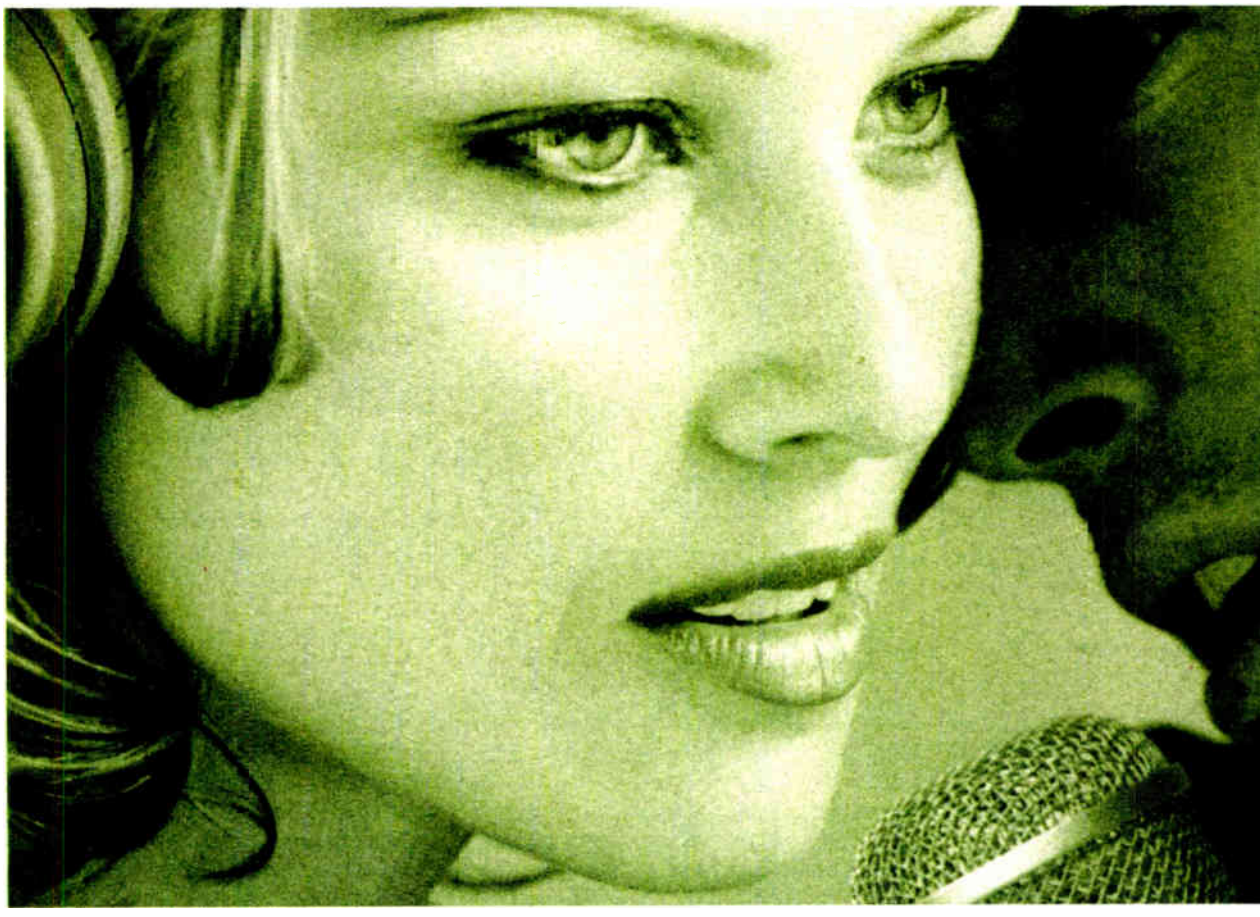
Options include an AM-FM tuner with RDS/RDBS. List prices start at $1,199.

As reported on page 1 of this issue, satellite digital radio is expected to launch sometime this summer. Numerous exhibitors at CES displayed their entries in this marketplace. The preproduction models include head units that are satellite-ready; plug-and-play tuner modules that plug into a consumer's existing head unit; and multimedia systems that incorporate satellite tuning.

Have broadcasters taken the mobile audience for granted? If so, what should they do now?

Whether from MP3, satellite radio or future wireless Internet technologies, it is clear that conventional broadcast media will have more competition, and may need to devise strategies to cope with the alternative media finding their way into listeners' vehicles.

Tom Vernon is a multimedia consultant. E-mail him at TLVernon@blazenet.net *or call (717) 367-5595.*



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Box Fill and Wiring Trays/Troughs

Charles S. Fitch

This is one in a series of articles about the National Electrical Code. The articles and supporting materials are available online at www.rwonline.com

In the Feb. 1 issue, we discussed "conduit fill," the calculation of the cross-sectional area of a conduit that is occupied by wires. To allow ease of installation of those wires, pushing and pulling them through the conduit, and to facilitate proper heat dissipation, the NEC limits the number, size and type of wires that can be installed in each trade diameter of conduit.

Surface and recess

Generally, we can place boxes in two groups: surface mount and recess mount. The recess mount can be further subdivided into "new work" and "old work"; this is mainly a differentiation of how they are attached. New work usually is mounted/attached to the firmament of the building with nails or screws. Old work typically is secured with a tension fit to the hole one has made in the sheet rock wall to accommodate it.

The NEC's restrictions on box fill are pragmatic, stemming from the extensive experience of the code's committee members and the suggestions of thousands of contributors. Whether it be for maintenance or installation, adequate space is required for wires, splices and devices (such as switches mounted on the cover) and to liberate the heat they produce.

Code standards and procedures for box fill and the maximum use of your box fill area are sprinkled throughout the NEC. Look at Article 370, among other references.

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Radio World encourages our readers to obtain a full copy of the code as a complement to this series and as a future reference.

Metal Boxes

Adapted from NEC Table 370-16(a).

Box Dimensions In Inches, Trade Size, or Type	Minimum Capacity ($in.^3$)	Maximum Number of Conductors*						
		No. 18	No. 16	No. 14	No.12	No. 10	No. 8	No. 6
4 11/16 X 1 1/4 square	25.5	17	14	12	11	10	8	5
4 11/16 X 1 1/2 square	29.5	19	16	14	13	11	9	5
4 11/16 X 2 1/2 square	42.0	28	24	21	18	16	14	8

Note: For S1 units, 1 $in.^3$ = 16.4 cm^3.
*Where no volume allowances are required by Sections 370-16(b)(2) through 370-16(b)(5).

Consider an example of how all this ties together. Pull down your 1999 copy of the NEC and follow along, or review the calculations as we come to them.

In the Feb. 1 issue, we outlined the circuits and the supply conduit needed for adding some new transmitters and terminal equipment when a new FM arrived at one of your transmitter sites.

For the conduit installation we discussed, what is the minimum box needed to receive those wires and distribute them to their various destinations at the transmitter room?

Our total wire count for the supply of that gear consisted of four No. 6 THHNs and six No. 12 THHNs sent in a main run of 1-inch trade size EMT.

NEC Table 370-16(a), excerpted above, gives us the volume that we can fill for standard boxes that do not have their actual volume marked on them. Let's say this 1-inch EMT terminates in an unmarked box measuring 4-11/16 by 2-1/8 inches.

Check the table. Let's start with our four No. 6 wires. The table tells us that for this size box we can accommodate eight No. 6 wires. Since we only have four, we might think we have half the capacity of the box left. Backing up to the No. 12 column, we find that this box can handle a quantity of 18 No. 12 wires, so we have sufficient capacity.

Or do we?

The NEC specifically instructs us how to count the wires in a box in Article 317 (b)(1). If a wire enters and leaves the box without a splice or a tap, then it is only counted once. If that wire is spliced or tapped, then it is counted for each point of entrance or exit.

If we just passed all the wires through this box and sent them on their merry way via other conduits to their ultimate destination, we would be perfectly compliant.

Our No. 6 wires are for the two new FM transmitters. These pass directly through this box, without splices or taps, and continue on in new conduits to the new rigs. These wires, then, are counted only once.

However, the CO circuit will be spliced in this box and dispatched via two separate conduits to convenient outlets around the room. The total count for this circuit is six wires, two in and four out. That makes our total wire count come to 10 of the No. 12s.

Using the standard box calculations, we can't wire the system this way using this size box.

What do we do?

We can pass the CO circuit onto a second, appropriately sized box and divide there. Or we can add a raised box lid that will add enough volume to the box to allow this extra wire.

Also, we could look at the box that we've bought to see if the manufacturer has indicated that his product actually has a larger volume.

The NEC has given us another table, 370-16(b), shown on page 15, with the exact volume that the code wants for each counted wire. Suppose our box is marked 47 cubic inches, or 47 $in.^3$.

According to the table, the specified volume for each No. 6 wire is 5 $in.^3$ and for each No. 12 is 2.25 $in.^3$. Multiply the number of wires of each size by its allowed space from the table, and add the totals. In this case, the calculation is 4 times 5, plus 10 times 2.25. The total is 42.5 $in.^3$, which

See NEC, page 15 ▶

Whether for maintenance or installation, adequate space is required for wires, splices and devices, and to liberate the heat they produce.

The six No. 12 wires are allotted to three different 20 amp circuits, which are the equipment rack, heavy gear such as the air line pressurizer and some convenience outlets (COs).

In this box, the first two circuits will pass through to the conduit that leads to the equipment rack and onto the pressurizer. These four wires, then, are not tapped or spliced and so are only counted once.

NEC

▶ Continued from page 14

is less than the 47 in³ marked on the box. We can install this as we desire.

We have a little space left over. Could we install a convenience outlet right on this box?

In this same area of the code, at 370-(b)(4), the NEC says that if we have a device like a CO mounted on the box cover, we must allow twice the volume of the largest wire attached to that device to allow space for it.

The biggest wire is a No. 12, so twice 2.25 would be 4.5 in³. Providentially, we have just made it with a total volume need of 47 in³ using a 47-in³ box. The wires to this CO are not counted as they stay in the box.

Now let's be gluttons for punishment. How about two COs — a quad box?

With a flat cover, the flat answer is no. We would need another 4.5 in³ of volume. However, maybe we will be lucky and find a *raised* box cover with 4.5 or more extra volume to be added to the 47 in³ that we have. A box cover this large would only have to be about 1/4-inch high to make the needed extra volume.

Troughs and similar wire distribution devices not only have similar volume restrictions as boxes, but also bending radius caveats — a topic for another time.

Before we leave boxes, let me review two recent code changes associated with boxes.

The first is the length of wire you must allow for splices and connections at the box when you install and wire them.

At Article 300-14, during construction or installation we are instructed by the NEC to leave 6 inches of wire from the point that a wire appears in the box to allow attachment. There's a shorter-length alternative to this when the box size is small.

This shorter length may be compliant, but I find this to be an economy without a need. Why struggle or debate the issue when the cost of wire is so small? Make it easy on everyone and always be fully compliant by leaving at least 6 inches for attachment or splicing.

The second item is the proper way to attach devices such as switches and outlets at the box.

You can no longer use the device, such as an outlet, as the splicing device. If the circuit continues past that device, you have to make up a pigtail. See the previous article on this subject at the RW Web site.

Next time we'll look at cable tray.

Charles S. Fitch, W2IPI, is a registered professional consultant engineer, a member of the AFCCE, a senior member of the SBE, lifetime CPBE, licensed electrical contractor, station owner and former director of engineering of WTIC-TV in Hartford, Conn., and WHSH-TV in Marlborough, Mass.

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

Volume Allowance Required per Conductor

NEC Table 370-16(b).

Size of Conductor (AWG)	Free Space Within Box for Each Conductor (in.³)
18	1.50
16	1.75
14	2.00
12	2.25
10	2.50
8	3.00
6	5.00

Note: For S1 units, 1 in.³ = 16.4 cm³.

MARKET PLACE

NTI Extends Minilyzer Family

The MiniSPL Sound Pressure Level tool from NTI extends the functionalities of the company's Minilyzer.

A Minilyzer ML1 operating with the MiniSPL develops acoustical measurements.

Features of the combined system include 1/3-octave spectrum analysis; standard frequency weighting filters, A, C and linear; standard time response modes of fast, slow and impulse; selectable integration intervals with start, pause and stop functions; and Minimum/Maximum display function.

The retail price is less than $300.

All MiniSPLs are calibrated at the factory. The test system also offers a custom calibration function that allows users to calibrate it with a preferred calibration tool. With its internal power supply, the MiniSPL can be connected to any audio input device without phantom power supply or preamps.

All new Minilyzers include version 2.0 software, enabling them to operate with the MiniSPL. Buyers of the MiniSPL using a Minilyzer with earlier software are entitled to obtain a free copy of the new SW 2.0.

For more information contact the company in Quebec at (800) 661-6388 or send e-mail to canada@nt-instruments.com

To Tube or Not to Tube . . .

Solid-State or Tube-Type? Some Important Considerations When Buying a New Transmitter

James G. Withers

Not so many years ago, a decision to buy a new transmitter meant picking the brand with which you were most comfortable, negotiating the deal and waiting for delivery.

In FM transmitters, most lower-power models used a 4CX1000, 1500 or 5000 tube. A 20 kW unit meant a 4CX15000, and the really heavy iron used 4CX25000 or 4CX30000s.

Transmitters also were sold with triode power tubes, such as in the 3CX3000.

But whichever flavor you preferred, the order of the day where the power amplifier was concerned was tube, plain and simple.

Considerations

Since the 1980s, buyers have been faced with a choice: stay with the tried-and-true tube-type transmitter or switch to a solid-state variety.

At first, the choice may seem to be a no-brainer. Solid-state devices have come far since the early germanium days, when any room temperature above meat-locker range immediately destroyed the transistor. Modern MOSFETs don't exactly thrive on high temperatures, but neither do they self-destruct under any reasonably normal conditions.

Add to that the efficiency factor and graceful failure modes of modern solid-state transmitters, and it would seem at first glance that a compelling argument could be made for forgetting tube-type transmitters altogether in favor of solid-state.

That argument would overlook several points that favor tubes over solid-state transmitters. In fact, tube transmitters not only survive in today's broadcast environment, but quite a few are sold.

Why is this? What factors should be considered when making the choice between tube or transistor?

Prior to listing the pros and cons of both types of transmitters, let us state a couple of points.

Most, if not all, new broadcast transmitters use solid-state IPA stages. So the arguments made here regarding the advantages of tube-type transmitters actually refer to transmitters that are hybrids — units that have solid-state intermediate power amplifier stages feeding tube PA stages.

Also, very-low-power transmitters (1 kW and under) also are almost exclusively solid-state these days, so they are not factored into this discussion.

That being said, let's go to press!

Let's start by considering capital vs. operating costs.

From an initial cost standpoint, tube transmitters win, hands down. My most recent price comparison, within the past year, shows a price differential of about 20 to 25 percent between the types, with solid-state being the more expensive.

This difference seems to remain fairly constant across the range of available power outputs, so in actual dollars, the gap widens as the power goes up.

If just the initial purchase price is considered, the compelling argument would seem to tip in favor of the tube-type transmitter.

Ahh, if life were only that simple. Operating expenses must be factored in to get a true picture of transmitter cost, even though the initial purchase price of the transmitter is a capital expense (depreciated over the life of the unit), while the operating cost is a monthly expense.

In my experience, the extra power charges will offset the lower price of a tube-type transmitter after three or four years.

The power amplifier stages in both types of transmitters have similar efficiency ratings, both being in the range of 60 to 70 percent, plus or minus a few percentage points.

These numbers, however, do not really tell the complete story. In a solid-state transmitter, there is little power consumption outside the shelves of ganged amplifier modules. Transistors, being cold conduction devices (as opposed to tubes, which are thermal conduction devices), generate little heat, because they have no filament.

What little heat exists is generated from the friction of electrons flowing through the device, and that amount is carried off easily by a heat sink. Each module has a couple of muffin fans to carry the heat off the sinks and out of the module.

Of course, the power supply is not without conversion losses, but as a function of the overall power consumption, these are relatively minor concerns.

Not so with the tube-type rigs. Instead of using small muffin fans, there is a large, direct-drive blower motor, sometimes as large as one horsepower or more, drawing 10 amps of 208 three-phase power every time the filaments are powered up.

Cost factors

Also to be considered are the screen power supply, the bias supply and the filament power supply. All of these elements use power, and decrease the overall efficiency of the transmitter. This takes the power factor of a tube-type transmitter down below a typical 50 percent, while the solid-state model chugs along at nearly the same efficiency as the combined output devices when considered by themselves.

So even though it appears that a tube transmitter is cheaper, in the long run you will pay the piper in the form of higher operating costs.

In my experience, at somewhere around three or four years, the extra power company charges will offset the lower initial purchase price of a tube-type transmitter.

IRR

If the only factors to be considered are initial cost and operating cost, a graph can be developed using your company's Internal Rate of Return — just another way of saying how much your company figures it should earn on money it controls.

Chart the initial cost difference between the transmitters, the value of that money over time and how long the transmitter will have to last. From those numbers, you can calculate a total operational savings, and compare the types fairly.

Ahh, again, if life were only that simple.

Operational reliability must also be considered. In this area, solid-state transmitters have an advantage, but not an overwhelming one.

Because even modern solid-state devices are limited in power-handling capabilities — 500 watts being about the limit for a single device — manufacturers use internal combining networks to gang MOSFETs to achieve the desired output power.

Graceful failure

This arrangement, while somewhat inefficient and expensive, has a nifty advantage. When two or more devices are paralleled into a combining network, there are always some losses, due to variations in circuit tuning and device conduction characteristics.

To keep these losses from reflecting back into the devices themselves, burning them up in the process, the combiner has a main output and a reject load output. The radiated RF goes to the output and the losses are absorbed as heat in the reject load.

Here is where the nifty part comes in. If one of the radiating transistors burns up, the other one continues to make power. No catastrophic failure, just a reduction in output power.

(Actually, since the circuit is now completely unbalanced, the reduction is quite substantial: a full 75 percent from normal. This is because the first transistor blows half of the power it is making into the reject load. Fifty percent of the original power went away when the first device burned up, and now, 50 percent of the remaining 50 percent is absorbed as heat in the reject load.)

However, solid-state transmitters are made up of several "shelves" of combined circuits, sometimes 20 or more. As individual transistors fail, the power drops in small increments.

This is known as a "graceful failure" mode. No crash and burn, just a stairstepping down of output power as devices fail. It takes a horrible occurrence (unfortunately, not unknown in our business) to take out 10 or 20 transistors, so a total cessation of RF is unlikely due to a failure of output transistors.

There are, of course, mission-critical components in a solid-state transmitter, the failure of which can result in dead air. They include main power feeds and circuit breakers, VSWR failsafe circuits and power supply components.

As rugged as modern solid-state devices are, they are still more vulnerable to lightning strikes compared to a ceramic-bodied power amplifier tube.

Things can and will cause solid-state transmitters to give it up, but how do they stack up against failure modes in tube transmitters?

All or nothing

Tubes do wear out, due to the slow but steady erosion of the electron-rich material boiling off the incandescently heated filament, causing a gradual reduction in output power.

Beyond that, tube transmitters, although extremely rugged, are plagued by the "all-or-nothing" syndrome. Most tube failures are catastrophic. One minute the ol' rig is humming along; the next, it's belly up. The reason: there is only one radiating device in the transmitter. If it fails, that's it; show's over.

Moreover, there are multiple failure points that can cause the same results: Open or shorted screen power supplies. Open filament transformers or return circuits. Shorted plate insulators, sometimes called blockers.

An absolute army of parts can occasion the dreaded "off-air" call from the remote control.

Still, modern tube transmitters are reliable to an amazing degree, and as stated above, extremely rugged, being relatively impervious to mistuning, near-lightning hits and other bogies.

Many, perhaps most, tube transmitters literally run for years with not a minute of downtime due to unplanned total failures. However, that record must be tempered with the realization that those failures, rare though they are, are still by definition, "total."

So, tube or not tube? That may be the question, but the answer is not definitive. It really does depend on many factors.

Does your station have a healthy standby? Do you have enough capital to invest in a pricier rig to begin with? How long will you or your company own the station? How much does power cost in your market?

These are all factors to weigh when making this decision. The competent engineer will give them careful consideration before making a recommendation he or she will have to defend every time the phone rings in the middle of the night.

James G. Withers is director of engineering for Pacific Broadcasting of Missouri in St. Louis.

RW welcomes other points of view.

On The Air

A Monthly Newsletter from Broadcast Software International Issue 2

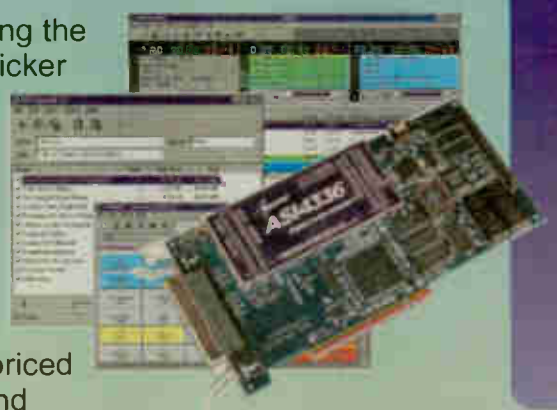
News

System Design Made Easy

What do you do when you want more than software, but don't need a turnkey system? Look to BSI's new studio automation kits.

BSI's new Studio Kits give greater design and cost-saving opportunities to broadcast engineers and studio designers. The three kits are optimized combinations of software and hardware customized for small, medium and large market broadcasters.

"These are complete two-studio automation kits... just missing the PC's," says BSI President Ron Burley, "System design is quicker and easier because we've done all the difficult research and testing."



The Studio Kits come in three configurations and offer significant savings when compared to purchasing the components individually. The $4,799 US Studio Kit 100 is geared towards smaller markets and single stations. The Studio Kit 200 provides the versatility and power required in mid-sized markets, for just $6,599 US. The Studio Kit 300, priced at $9,999 US, is a world-class package for major markets and enterprise broadcast facilities.

Each Studio Kit contains all of the hardware and software needed to equip a production and air studio. Among the products included in the Studio Kits are BSI's acclaimed WaveStation digital automation system, Cool Edit Pro editing software from Syntrillium Software and professional audio adaptors from AudioScience. Each kit also comes with one year of free tech support and software upgrades.

"With our Studio Kits, all you need is a Pentium class PC and you're on the air," says Burley. "Our customers often already have computers or have the ability to barter them. Studio Kits give them the ability to build a top-of-the-line system using that hardware."

Quote of the Month

"We were in a lot of trouble and you bailed us out. Your software and customer service are above and beyond the industry standard."

Katina Stamat
WPDQ- Howell, NJ

Calendar

Apr 24, Demonstration of a new product at the NAB by BSI President Ron Burley. Call for an invitation.

Aug16-18, WaveStation Weekend

Birthdays:
Mar 25 1942, Aretha Franklin
Mar 25 1920, Howard Cosell

Tip

Dynamic Web site

You don't need an expensive hosting service to have a dynamite station web site. BSI's $1499 US WaveStation automation software can automatically post to your web site what's playing, recently played and what's coming up. Build your own page with station graphics and text, then just insert a few special HTML tags for WaveStation to fill-in. You can even give songs and spots their own web pages or frames. Banner ads anyone?

User File

KRQZ - Lenny Harris

Lenny Harris of Trinity Church realized that he wanted to combine his love of music and his ideals into a radio station for teens. "We searched a long time for an automation system," said Lenny. "We didn't have a large budget, so we needed something that was going to be affordable, user-friendly and really easy.

"I downloaded the WaveStation demo and was able to figure it out just by playing with it. Other stations I asked about the program were really happy with it. I was pretty sold on buying the WaveStation, and then I went back to Ohio to see our network and they were using it. I thought if it worked for them, it would surely work for us."

WaveStation has been a KRQZ hero. "We were on network, but nothing was coming out," recounted Lenny. "It only took me a few seconds to get our next stopset on-the-air and line up a few songs to cover the outage. WaveStation saved the day."

Lenny is really happy with his system. "We checked just about every other kind of software out there. There're a lot of good people in the industry, but BSI's WaveStation is the most reasonably priced and user-friendly product that we found anywhere." Send us your User File story.

WIRED FOR SOUND

Ruminations on Digital Audio

Steve Lampen

Every so often, someone sends me an e-mail or corners me at a trade show to tell me their weird story about wire. Sometimes, a certain kind of wire worked in a situation where it shouldn't.

For instance, I once gave a talk about using Category 5 (computer) cable for running RS-422 or RS-485 control applications. After it was over, a number of engineers took me aside, one by one. Each one whispered, with almost a guilty smile, that they had been using Category 5 for these applications for years. And they didn't know why or how it worked, but it did.

At least they didn't know why until my talk. They were all proud of their discovery, now that the truth had been revealed.

The engineers whispered, with almost guilty smiles, that they had been using Category 5 for such applications for years.

WETA

In the same way, I was surprised to read an article by Eric Hoehn in the Aug. 2, 2000, issue of this newspaper titled, "WETA: All-Synchronous Digital," describing the design of an all-AES digital radio facility. In this case, the entire system was based on the AES-3id standard that runs digital audio down coax cable.

Now, there are dozens of TV stations wired up with digital audio on coax. But for them it makes sense, because they already use coax to run video. In fact, they can use the same cable to run both digital audio and video (although the quality of cable used for video is overkill for digital audio).

Then we have the recording studio, which is unquestionably the "high end" of audio. There are a few recording studios wired up for digital audio on coax, most notably Hollywood Digital in (where else?) Hollywood, Calif.

But the RW article was the first time I have read of an all-coax digital audio install for radio. And that is probably because radio has been a twisted-pair audio world since the beginning.

So it's natural that most radio engineers would think twisted pairs for digital too. And why not? The original AES/EBU standard was twisted pairs, although quite a different animal from the analog twisted pairs. With a characteristic impedance of 110 ohms and very low capacitance, these cables are more data cables than audio cables. But then, the digital audio signal is more data than audio.

Benefits

The advantages to using coax are very long runs and very small connectors (BNC) compared to XLRs or other connector options.

In fact, you can order some digital audio consoles with all BNCs. You can imagine the space savings on that back panel, not to mention savings in weight. And BNCs can be connected to coax cable a lot faster than XLRs can. Their performance, even into the gigahertz, is common knowledge.

The disadvantage to coax and BNCs is the loss of a balanced line with its common-mode noise rejection. On the other hand, digital signals are inherently noise "resistant," because noise often can be filtered out, leaving the data untouched.

So should you go with coax for audio? Let's just say it's an option you might consider when you get to that point.

In the same article, Hoehn mentions using Category 5 cable for digital audio. I've mentioned this in previous columns; let's look at this in greater detail.

Return loss

The AES/EBU spec for balanced line cables requires a characteristic impedance of 110 ohms ±20 percent. That means a cable between 88 and 132 ohms should work fine. Category 5 cable is specified as 100 ohms ±15 ohms, or a range of 85 to 115 ohms. You will note that, unless the Category cable is at the very low end of its allowed tolerance, it will fit well into the required spec for digital audio. And there are bonded-pair Category cables with much tighter tolerance that fit easily into the digital audio requirement.

So why not use Cat 5 for digital audio? Hoehn mentions one reason: impedance mismatch. This mismatch leads to "return loss." Transmitter engineers will recognize return loss as VSWR. At high frequencies, this is an impedance discontinuity that reflects the signal back to the source (that's the return), and looks like attenuation at the other end (that's the loss).

So is there "return loss" when you use a 100-ohm cable (Cat 5) on a 110-ohm device (AES/EBU digital audio)? Sure. But calculations show the return loss to be a miniscule –26 dB loss. (See table.) Not a whole lot to worry about. And this assumes that the source and destination devices, and cable itself, have exactly the stated impedance, which they often do not.

How about the worst case, putting 85-ohm twisted pairs on a 132-ohm digital audio device? Then you have a serious return loss of 13.3 dB.

Tighter tolerance

More likely, the digital audio devices probably are closer to 110 ohm outputs, especially if they are active balanced inputs or outputs. In that case, return loss of a worst-case Category 5 (85 ohms) would be 17.8 dB.

For these digital applications, because you have no way of knowing just where your Cat 5 cable would be in impedance, your best bet would be to use Category cables with tighter tolerances than generic versions. Tight-tolerance bonded-pair Category 5e cables have typical specs of 100 ohms ±7, a lot better than generic Category 5. You can see their advantage. Their worst-case return loss (110 ohms vs. 93 ohms) would then be a return loss of –21.5 dB.

Have you ever used a cable in a weird application, perhaps one that all your engineering friends insisted wouldn't work? I'd love to hear about it. In my next column, I will regale you with some of the stranger stories of wire and cable I've experienced. Some of these never have been explained, even by "experts." Maybe you can solve the mystery!

My email address is below. Tune in next time.

Steve Lampen is atechnology specialist, multimedia products for Belden Electronics Division in San Francisco. His book "Wire, Cable, and Fiber Optics for Video and Audio Engineers" is published by McGraw-Hill.

Reach him at shlampen@aol.com

Return Loss

Return Loss can be calculated. Here's the formula:

-20 log difference/sum*

That gets you the value in dB. Here's what this means in terms of loss:

10 dB = 0.50 dB additional loss
13 dB = 0.22 dB additional loss
15 dB = 0.14 dB additional loss
18 dB = 0.08 dB additional loss
21 dB = 0.04 dB additional loss
23 dB = 0.02 dB additional loss
26 dB = 0.01 dB additional loss

Now half a dB may not sound like a lot, but consider that a 48-kHz AES signal has a bandwidth of 6.144 MHz. Category 5 has an attenuation of 5 dB/100m at 6 MHz. So a half a dB is an additional 10-percent loss in signal strength, or a 10-percent reduction in cable distance.

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WRBS

▶ Continued from page 10

He also said the audio is carefully loaded at consistent levels.

"Ninety percent of recorded audio is now played from the AudioVault drives. We use very little tape except as backup and for the few programs that still come to us on DAT and cassette."

Backups

Allen said that, although PC-driven systems can be fragile, he's only seen a few small problems.

"If the console were to crash, it would stay on in the same configuration as it went down and play the entire time. A reboot takes less than a minute. An AudioVault reboot can take 5 to 8 minutes, and for that eventuality we have more than enough material stored in our 360 Systems Instant Replays.

"And to keep us going during an outage, all gear in the station is backed up with uninterruptible power supply and generator power."

Control Room Left Side

Chief Engineer Peter Allen, seated, worked with Contract Engineer Jerry Davis on the project.

Allen said Fran Manzella of Francis Manzella Design Limited designed "a great-looking control room that also functions as a full-featured talk studio. We took what was going to be the adjacent talk studio and turned it into an equipment room/producers office, which also cut down on clutter, noise and heat in the control room.

"Then it was up to Vince Fiola's Studio Technology to build and install the studio furniture. He not only met our delivery date on budget, but added some of his own nice touches. The materials and craftsmanship are really first class."

WRBS Studio Inventory

Air:

Klotz Vadis DC-12 Digital Console with:
- (3) Audio Mainframes interconnected by Ethernet and Fiber Optics
- (3) 32 Port GPI Interfaces

BE AudioVault with 340 GB of storage and 3 workstations
- Mirrored servers running under Windows NT4
- Stores/forwards over 140 satellite programs each week

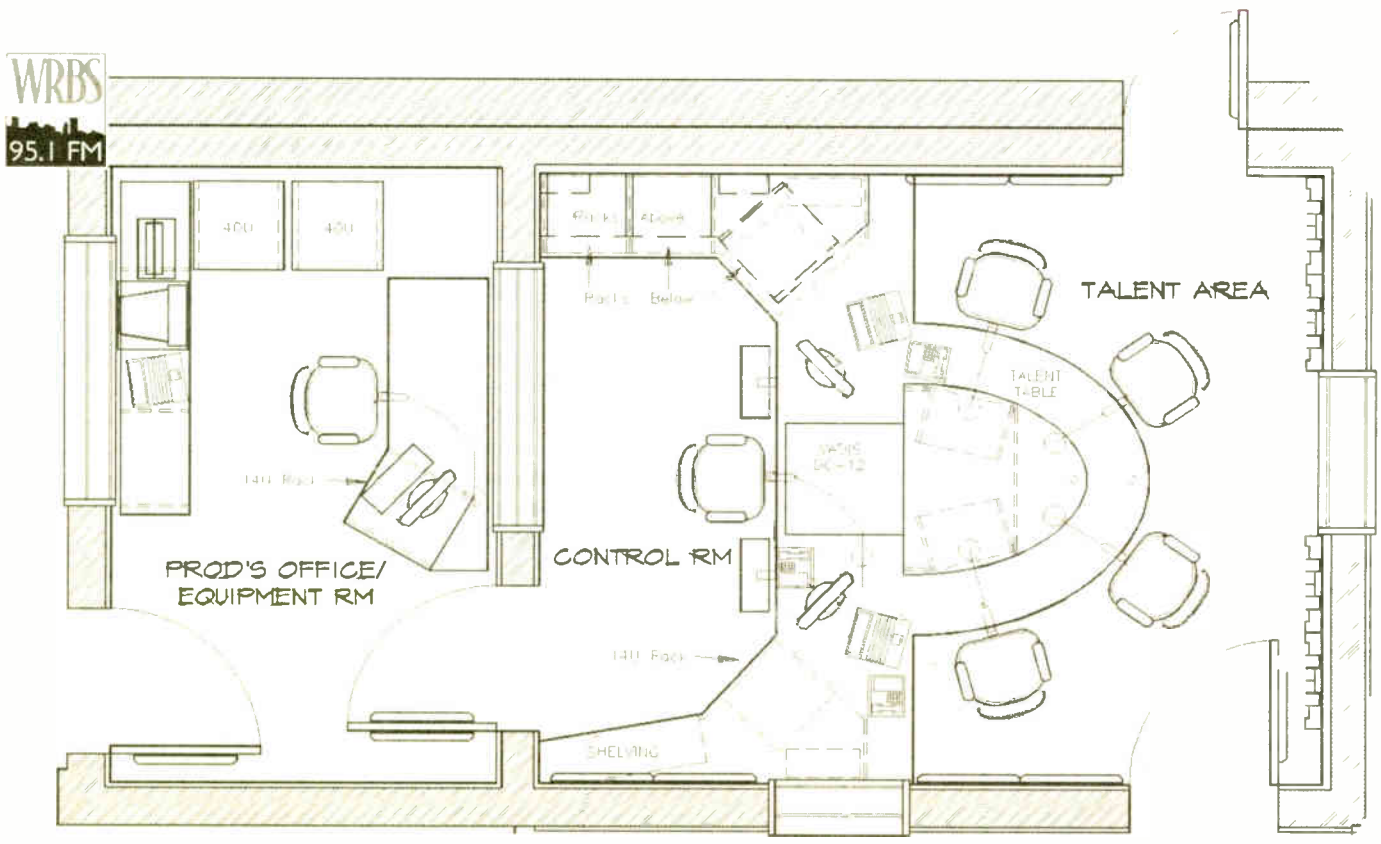
Radio Systems StudioHub
- (6) Hubs
- (4) Patch Bays
- (1) Distribution Amp
- (115) CAT 45 connections throughout platform

(3) EV RE27D microphones
(3) EV RE20 microphones
(2) Symetrix 528E Voice Processor
(1) Symetrix 628 Digital Voice Processor
(1) Comrex Matrix ISDN/POTS codec
(1) Musicam USA CDQ Prima 220 ISDN codec
(1) Telos TWOx12 Digital Telephone Hybrid
(2) Tascam CD-450 CD players
(2) Tascam 122 MKIII cassette decks
(2) Panasonic SV3800 DAT Recorder
(1) 360 Systems Short/cut
(1) 360 Systems Instant Replay
(1) Sony MDS E-11 MiniDisc Deck
(2) JBL LSR Studio Monitors
(2) JBL Control One low level monitors
(1) Crown D-75 Amplifier
(1) Denon TU380RD Receiver
(1) Eventide DB500 Digital Delay
(1) Wegener Unity 4000 Digital Satellite Receiver
(2) Viewsonic VG150 LCD flat monitors
(1) Gentner silence sensor
(3) CybexSwitchview and Longlines KVM Switches

Production:

(1) Auditronics 200 Console
(1) BE AudioVault workstation
(3) EV RE20 microphones
(2) Tascam CD-450 CD players
(2) Tascam 122 MKIII cassette decks
(2) Panasonic SV4100 DAT machines
(1) 360 Systems Short/cut
(1) 360 Systems Instant Replay
(1) Roland DM-800 Digital workstation
(2) Cybex Switchview and Longlines KVM switches
(1) Viewsonic VG150 LCD flat monitor

The station has a Newsbooth almost identical in equipment to the Production studio.



Studio Drawing by Francis Manzella Design Ltd.

While time was saved running fewer wires, the layout and programming phases made up for it.

"After we had placed our orders, we found that XM Satellite Radio was also utilizing Klotz, StudioHub and Studio Technology to build their Washington, D.C., studios, and we drew on their expertise to get it all assembled."

In the end, Allen said, the station has exceeded its expectations.

"We were able to tweak and fine-tune the entire studio to the unique needs of a major-market Christian radio station."

The proof is on the air, according to Station Manager Lawhon.

"The audio is more consistent. I can hardly notice any difference in any frequency response in what I hear now. Given the number of different sources, that's quite impressive."

Ty Ford's audio equipment reviews and V/O sound files can be accessed on the Internet at www.jagunet.com/~tford

FIRST PERSON

We Were Poor, and We Knew It

William J. Ryan

Many survivors of the 1930s Depression in America say, "We were poor, but we didn't know it."

My first job in broadcasting was working as an announcer for KEYY(AM) in Pocatello, Idaho, a 250-watt radio station which was underfinanced from the beginning and was never a commercial success, meaning its staff had little money. It was poor and we knew it.

Post-war flood

During my growing years, I developed a hero worship of the great network radio announcers. I vowed that someday I'd be like them, but I needed a break.

The one radio station in Pocatello had been there for years, serving the public well with NBC network and local news and entertainment programming.

At the end of World War II, the FCC was flooded with applications for construction permits and broadcast licenses.

Early in 1946, two new stations were licensed in Pocatello. I wasted no time in collaring the manager of one about a job. He said he had no openings, but we did talk about my producing and announcing a high-school program.

Thus my foot was in the door for a glamorous career. My high-school show turned out to be a local hit.

Came May, 1947, I graduated, and KEYY's boss hired me at 65 cents an hour. If I'd had the money, I would have gladly paid him for the experience.

The station was located in a new but small building that fronted on the highway and backed into an apple orchard and pasture owned by the manager, who lived next door. Farther back in the pasture was the station's 190-foot tower. The owners built a smaller tower in front of the station for advertising.

Feeding the big tower was a Collins 300-G transmitter. Because I did not own a First Class FCC Operator's License, I could not run the transmitter but worked in tandem with a non-announcing license-holder.

Scraping by

Our console was a tube-driven Collins with one broadcast channel and one audition channel for cueing records or setting levels. The potentiometers were large knobs, and the switches were three-position vertical.

The announcer sat at a U-shaped linoleum-covered desk on a wheeled secretary's chair. The console was in front of him and at his sides were two 16-inch Presto turntables with Western Electric arms. CE Julian Dennis carved arms for LP records from wood, and found cheap pickups for them.

The control room microphones were a large Shure Bros. model and later a Western Electric saltshaker.

A floor-model speaker with a cabinet in the style of the 1920s supplied our control-room broadcast audio, with a smaller wall-mounted speaker for cueing.

The station had a semi-portable Presto disk-cutter for recording programs of all sorts, including remotes. I remember taking this monster to a dance hall to record the Tommy Dorsey band. We were forced to shoo couples away from our location near the stage, fearing the vibration of their dancing feet would jar the needle cutting the disc.

Commercials were few. I could never figure out how the boss paid the power bill, and our meager salaries, with so little money coming in.

The station would have probably folded if Dennis had not been so inventive. We needed something to hold the copy book atop the console, but could not afford to buy one. Dennis took an old 16-inch transcription with an aluminum base, scraped off the vinyl and bent the metal into just the shape needed.

At an earlier time, the transmitter's power supply burned out. He located an old stepdown transformer and turned it around to make it a *step-up* transformer, which worked fine.

Dennis also worked an announce shift. He created a swap shop show which he called "The Fence." When I visited with him 50 years later, he still expressed pride in his shtick of describing the sale items in low, confidential tones with back-room piano playing under his voice.

His was one of the most popular shows on the station, and did attract sponsors.

Lightning storms often blew out the costly current meter at the base of the antenna tower. Dennis rigged a "double pole make before break" knife switch, which removed the tower meter from the circuit during a storm but allowed the antenna current to be read at the transmitter.

There was a nice carpeted studio visible through the window from the control room. My high-school show, "Poky Highlights," originated there, as did musical shows and country and western acts from some of the downtown bars. There were two Shure mics in the studio.

Here comes tape

Around 1950 or so, we obtained a Brush Sound Mirror, our first venture into the new field of tape recording.

The machine's capstan was covered with cork, which often let the tape slip and ruin the recording. Julian remedied this by removing the rubber tire from a child's toy car and rigging a spring to hold it firmly against the capstan. There also was a problem with early paper tape, which tore easily. He couldn't fix that.

Some years later, after an ownership change, the station was equipped with rack-mounted Magnecords, which were great. Dennis modified two of these so we could record a network program while playing another back on the same tape. The familiar brown plastic tape was available by this time.

Eventually I was laid off and soon found a job at a station that always made money and owned wonderful, factory-made equipment. I also served as a night watchman by occupying a small room at the station.

There was the night I called the law in panic after awaking to find a group of men apparently trying to steal the transmitter. But that's another story.

The ingenuity of Julian Dennis taught me a great lesson about "making do" with what you have if you can't afford to buy it.

Bill Ryan is a retired college professor and former broadcast news writer-editor for UPI. He gives illustrated lectures on the Golden Age of Radio and on interurban transportation in North Texas. Reach him via e-mail to Wryan1807@aol.com

Share your radio memories with us via e-mail at radioworld@imaspub.com. *Early photographs are encouraged in particular.*

Jazz station **KUVO(FM)** in Denver recently completed a digital plant conversion and facility upgrade, including a **Nautel** transmitter, **Logitek** Numix digital consoles, **Shively** antenna, **Harris** digital microwave and **Omnia** FM Veris processor among its major components.

KUVO Chief Engineer Mike Pappas and assistant John Mikity set up for a live jazz recording using Neumann microphones.

The station, which does a lot of live performance programming, is making extensive use of the **Neumann** KMS 105 and other mics. For music recordings, KM 184s are used on guitars along with M 147s on reed instruments. M 149s are often used on vocalists while U 87s and KMS 105s are used for announcers. Neumann TLM 103s are also part of the house mic complement. ...

European transmission services company **Tele Diffusion de France** bought 120 **Orban** Optimod-FM 2200 digital audio processors. They have been installed at regional transmitter sites in France. The order was valued at more than $500,000 and brings TDF's installed base of 2200s to 270 units ...

Continental Electronics received an order for the purchase of four high-power shortwave transmitters from a customer in **China**. The order calls for the purchase of two 100 kW shortwave transmitters and two 500 kW shortwave transmitters. Terms of the contract were not disclosed.

Adil Mina, Continental Electronics general manager, said, "In the last decade we have sold more than 20 100 kW shortwave transmitters and 10 500 kW shortwave transmitters to the Chinese." ...

The Associated Press inked a deal with **XM Satellite Radio** under which AP's All News Radio (ANR) will be delivered into cars, homes and wireless devices. XM will provide its listeners ANR's real-time news and information, 24-hours per day as part of their new satellite radio service.

ANR is a turnkey network, providing ready-to-air news and features. AP will also provide its online, audio actuality database, SoundBank, and its ready-to-air broadcast news wires to aid in XM's production of in-house produced channels.

XM also signed programming agreements with **National Lampoon** and **Firesign Theatre** and with the **Discovery Channel**, the educational television network, to provide material for XM's radio service.

Meanwhile, AP also announced product signings with **KSPN Sports** in Los Angeles; **XTRA 910 Sports** in Phoenix; Saga stations **WFMR(FM)** and **WJMR(FM)** in Milwaukee; **AVC Communications** in Cambridge, Ohio; and the **Dakota Radio Group** ...

Jones Broadcast Programming (BP) said "Weissbach," its nighttime talk show hosted by Peter Weissbach, has begun airing on **KENS(AM)** in San Antonio and **WHIO(AM)** in Dayton.

Weissbach is fed via satellite from 9 p.m. to 3 a.m. ET, Monday to Friday, on Satcom C5, Tr. 23, Ch. 31 ...

Big City Radio was appointed exclusively to represent **Hispanic Radio Network**'s nationally syndicated radio programs, which air on 67 radio stations. The deal allows Big City Radio to deliver HRN's national network programming to national advertisers. ...

"Who's Buying What" is printed as a service to our readers who are interested in how their peers choose equipment and services. Information is provided by suppliers.

Companies with news of unusual or prominent sales should send information and photos to: Radio World Managing Editor, P.O. Box 1214, Falls Church, VA 22041.

Workbench

Radio World, March 14, 2001

Uh-Oh ... Tower Trouble!

★ ★ ★

John Bisset

You're enjoying the afternoon, when suddenly your cell phone rings. A frantic receptionist conferences you with a lady who reports that someone has climbed your tower, and has set himself on fire — committing suicide, she reports. The smoke is clearly visible, as you can see in Figure 1, right.

But you break out in laughter.

Practical joke? Just another crazy day in radio? We'll tell you more at the end of the column.

Fig. 1: What's wrong up on that tower?

Spring is a good time to make a thorough inspection outdoors — not only at the transmitter site, but on the roof of your studio complex.

A visual check of STL lines can spot problems before they occur. So what do you look for?

Are there grounds on the coax lines? If the weatherproofing compound has dried and cracked, figure water seepage won't be far behind.

Have you kept a log of your STL transmitter parameters? I used to use those easy-peel Avery labels so the front panel of the STL wouldn't be marred. All of the STL parameters were printed on the label, along with the date.

Water getting into STL connectors will cause reflected power to increase.

As you inspect the STL lines, also check the pigtails. These 2- to 3-foot jumpers that flex from the main STL line to the antenna can and will fail. Check for cracks in the outer jacket.

I always made it a rule to keep at least two spare pigtails. When the old ones were replaced, they were thrown away. There's nothing more frustrating than having a box full of pigtails in unknown condition. Don't waste your time; get rid of defective materials.

Fig. 2: Beautiful weather is a great excuse to check out what's happening on your building roof.

Fig. 3: Seal cable-entry pipes to keep out the elements.

The feed dipoles of the STL dish also can fail — although it's expensive, a spare is not a bad idea, especially if you care for several stations with the same type of STL dish.

If, during your inspection, you find that the connector ends are not weatherproofed, invest in a good weatherproofing kit from the manufacturer of your line. Yes, electrical tape will work, but it won't last the way the appropriate weatherproofing kit will. Why do the job twice?

Check that the lines are tagged. We

See WORKBENCH, page 24 ▶

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Workbench

▶ Continued from page 22

spoke about the tags sold by Antenna ID Products (phone (610) 458-8418) a while back. Knowing which line runs to which STL again can save a tremendous amount of time in an emergency. Now, when everything is working fine and the days are getting nicer, is a good time to tag your lines and document your STL system.

Documenting the STL system helps resolve other problems.

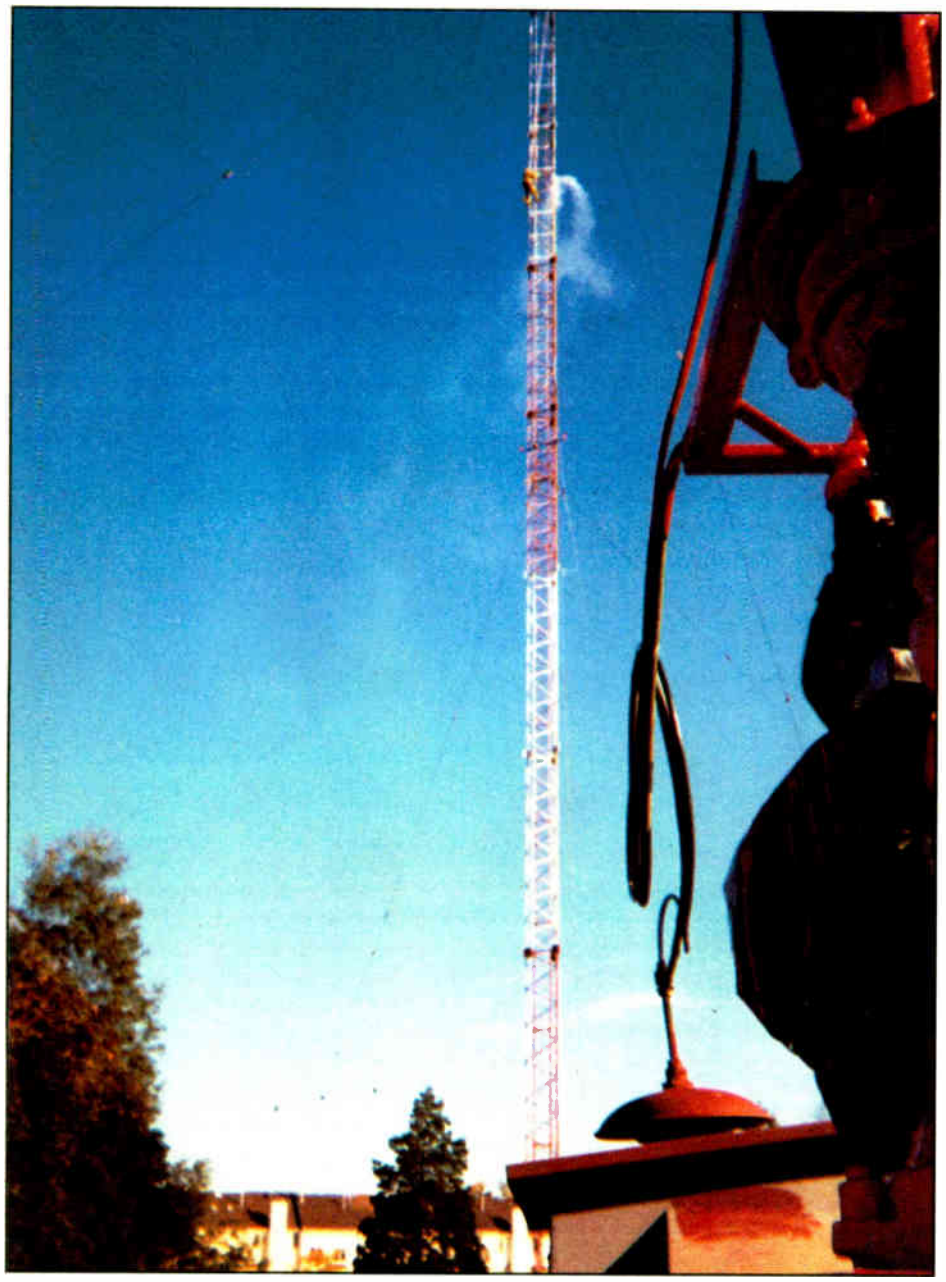

Fig. 4: The painting contractor is using compressed water to blast-clean the towers.

I've seen instances in which dish mounts have come loose, and the dish is not pointing at the receive location. Another problem is where the dish is aligned in a horizontal plane, and the feed dipole is set for vertical.

What does the mounting hardware look like? Is it loose; are the tower or building mounts secure? While on the roof, also check your scanner, mod monitor and EAS receiver antennas. Again, check the mounts for security or missing hardware.

Where television antennas are used for your off-air monitor, inspect the RF connection. Late-model antennas typically use type "F" connectors, but some still use twist lugs or screws which can corrode. The flexing of the antenna in the wind can also loosen or break the coax connection.

Inspect how the coax is supported. This is especially true for yagis, where the line may be looped through the antenna, or worse, connected with white wireties that long ago disintegrated.

Perform a similar inspection for any satellite dishes that are rooftop-mounted.

As you follow the cables to their building entry, focus on what the cable entry holes look like. Are they plugged with dum-dum, RTV or foam sealant, or will they permit insects and water to enter the building?

Figure 3, page 22, shows properly sealed pipes. You might note the flexible plastic-coated conduit protruding from the passage pipe. The cables exiting are for a satellite dish. The flexible conduit will protect the cables as they run over the roof to the dish — good (and cheap) insurance.

I remember being called to a station that was off the air. They lost their satellite feed while their engineer was on vacation. It didn't take long to find the coax, or what was left of it, lying on top of the ground, on the way to the dish, mounted out back.

The engineer was told to get the dish in ASAP — you know the routine, one of those last-minute satellite programs, or maybe a format change! Either way, the line had been hacked by both a lawnmower and a weed whacker, taking the station off the air.

★ ★ ★

Back to the tower smoke. The laughter from the engineer taking the report of the suicide on his tower was not a case of insensitivity.

Although it looked like someone was indeed smokin', the whole scenario was planned. His tower painting contractor used compressed water to waterblast the towers before painting them.

Figure 4, left, clears up the problem that could have been on the 6 o'clock news. As you get a chuckle from this photo, note how the base insulators were wrapped to prevent their being painted.

And thank you to Art Rose and Dave Garner with Bonneville's WTOP in Washington, D.C., for sharing the pictures with our *Workbench* readers.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

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

MARKET PLACE

RemoteMix Sport Goes Wireless

The newest version of JK Audio's RemoteMix Sport broadcast mixer offers a wireless phone interface, while the company's new Daptor One adaptor will make old mixers wireless as well.

The cue input jack on the new mixer will support two-way communications through any wireless phone with a 2.5 mm headset plug. The phone is used for making calls, but all audio signals go through the mixer.

Mic signals are beamed into the phone and earpiece signals and into the mixer headphones so a person can talk from the mixer while using the phone as a transmitter. A 1/4-inch-to-2.5 mm shielded cord is used for the connection.

The integral circuit was designed to emulate the electrical characteristics of wireless headsets to take advantage of the popularity of phones that use them.

The JK Audio Daptor One will make earlier models of the mixers wireless, using a battery-free mini-hybrid circuit that converts audio signals into balanced RJ11 phone line signals. The hybrid circuit also minimizes echoes.

Adaptors are available to modify phones without the necessary plug, converting their proprietary connector to the appropriate jack.

This feature is designed to be an inexpensive tool for sports and news broadcasting directly from the field. It allows the broadcaster to use a mixer and transmit the signals from the broadcaster's car and other convenient locations.

For information contact the company in Illinois at (815) 786-2929 or visit www.jkaudio.com

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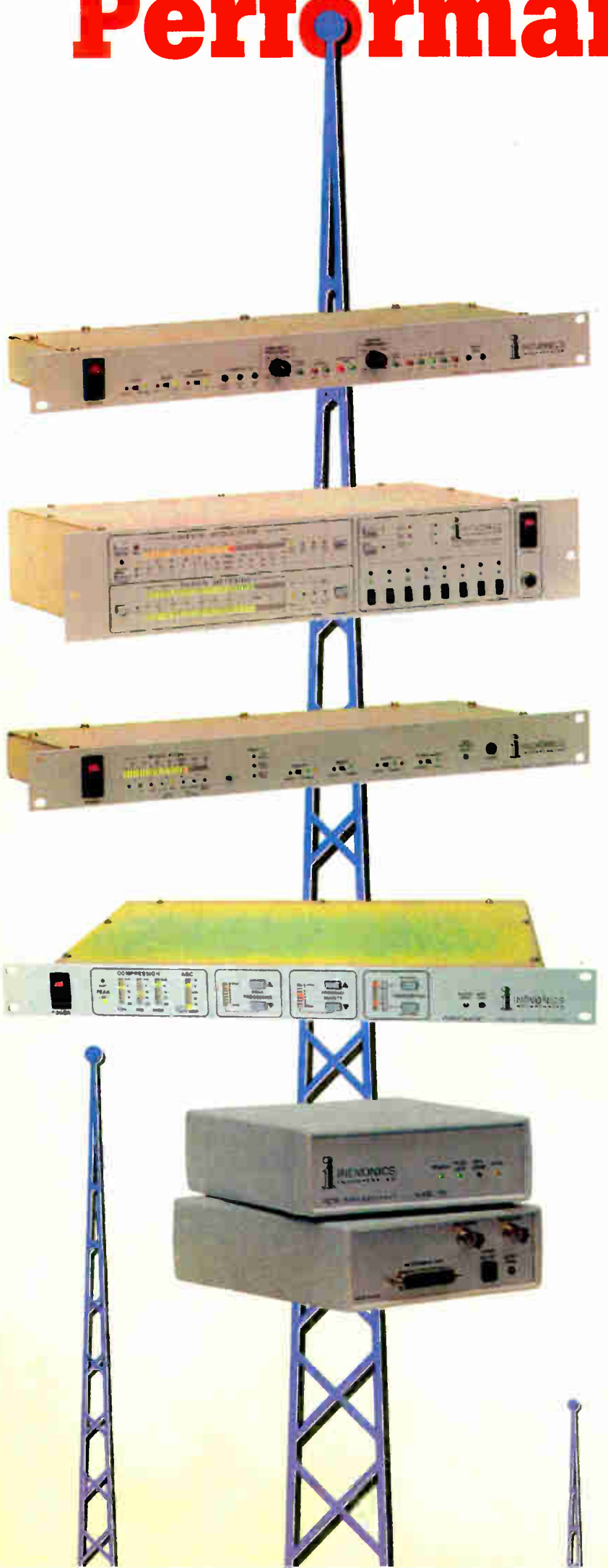

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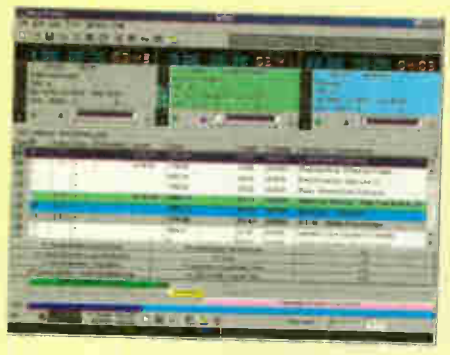

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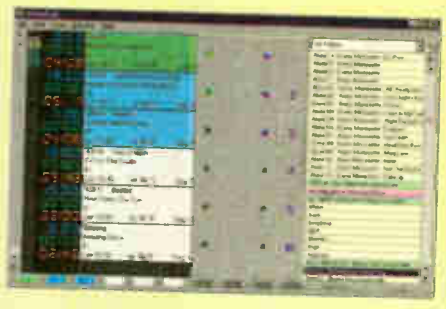

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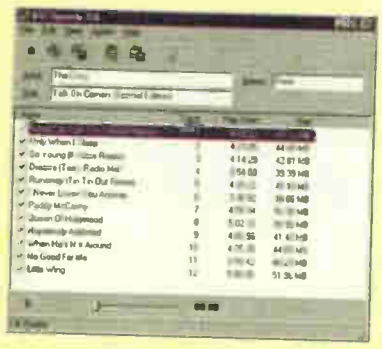

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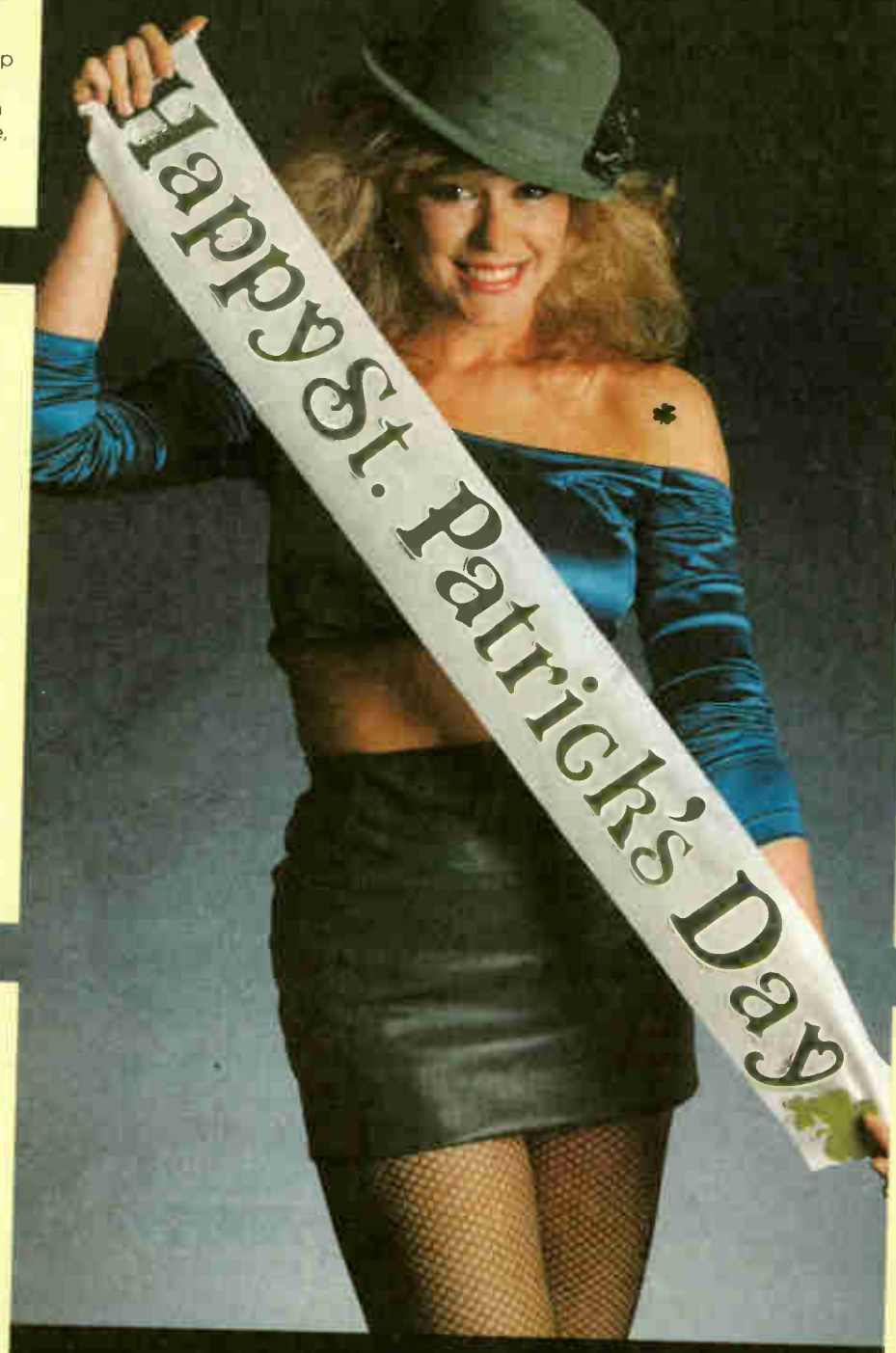

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GM Journal

Radio Funnies

See Page 40

Radio World | Resource for Business, Programming & Sales | March 14, 2001

Plan Your Summer Promos Now

Here's a Guide to Fill Out This Year's Summer Promotion Schedule And to Start Your Planning for Next Summer

Craig Johnston

Summer promotions are a year-round job. There's plenty of agreement on that statement.

"Many sponsors do their budgets around the end of the year, so if you're going to get them to include money for your event, you've got to get those dollars committed to you before those budgets are approved," said Doug Harris, whose job title is chief noisemaker for Creative Animal of Houston. It bills itself as a resource for broadcast marketing and mayhem.

The Children's Stage at WBIG(FM)'s 'Riverfest' Last Summer in Washington

During his career, he has given away, among other things, an oil well, a breast enlargement operation, a ton of kitty litter, more than 30 cars and trucks and roughly $1 million in cash. He once declared Halley's Comet as the sovereign territory of Texas. He awarded trips to Dracula's Castle in Transylvania, Romania, for Halloween night. Over the years he has employed a "street" fleet of novelty vehicles including a three-wheeled spaceship, an ambulance, a 1957 Rolls Royce, a Bigfoot truck and even a 40-foot brassiere on roller skates.

"Since I believe in letting programming lead the way on promotions, planning meetings at the station have to start as soon as summer ends."

Plan ahead — way ahead

"It's especially important to be working a year ahead if you're going after non-traditional revenue," said Al Vincente, executive vice president for Pamal Broadcasting Ltd., a division of Albany Broadcasting. "We like to start planning next year's quarter as we finish it this year."

The message is clear: The summer promotion schedule has to be done well in advance of the summer season. Experts like Vincente, Harris and Bill Barr, the Radio Advertising Bureau's vice president of co-op and nontraditional revenue, all talk of the importance of a post-mortem immediately following an event, while the memory of what worked and didn't work is fresh in your mind.

It isn't a meeting just for the promotion folks; programming and sales need to be at the table. The agenda should look at what went well and what could be improved. How was attendance? Could you get more signage? Did you have the right sponsors? How were the giveaways received? These are items that should be discussed. And the notes from this meeting should lay the groundwork for next year, according to Harris.

Barr recommends debriefing the sponsors right after an event.

"If the event went well and the sponsor is excited, what better time to ask them to renew for next year?"

Do all summer events have to be planned a year in advance? Vicente said no.

"Program maintenance promotions, which are smaller, can be handled six months, even 90 days ahead." He cites examples at one of his CHR stations, which does lots of concert giveaways and flyaways.

Sitting in the general manager's chair, Vicente has strong advice for both promotion and sales.

"The promotion people have to give plenty of advance notice and the sales people have to come up with meaningful giveaways."

These smaller promotions can fill in the gaps between the major promotions. Harris said some promotions, such as van visits, don't require specific on-air promotion.

"It's better to have them looking for your van everywhere, rather than specifying where it will be at a date and time."

But Harris said there can be too much of a good thing. "While it would be good to have a promotion every day of the week over the summer, you want to make a quality impression."

He suggests measuring the number of promotions against the size of the promotion staff, number of vans and budget.

Barr advises not to look for a slowdown in radio promotion activity. In a time when total marketing dollars are being squeezed because of the hiccup in the "new economy" dot-coms, he cites a recent IEG Inc. forecast that portends continued growth in support for promotion activity.

The IEG Sponsorship Report predicts a nearly 10-percent increase in sponsorship spending in 2001, down from 2000's 14-percent, but still a growth figure in a generally gloomy market. Topping the list of sponsorship events are sports, followed by concerts and festivals. (For more information on the IEG report, visit the Web site at *www.sponsorship.com)*

See PROMO, page 31 ▶

Jason Jarvis Presses on as Solo Host

Craig Johnston

In a radio landscape littered with shows that left the air when their hosts retired or died, "The Jason Jarvis Show" stands out.

Jarvis' mother Judy had been on the air with her syndicated talk program, "The Judy Jarvis Show," for seven years when she was diagnosed with cancer in 1998. During her 16-month battle with the disease, she promoted her son Jason, who had been her fill-in host and executive producer since in 1995, to full-time co-host. The show is syndicated by the Jarvis family.

Jason Jarvis in the Studio

Before joining his mother's show in Hartford, Conn., Jarvis had been working as a writer in Washington for "The Hotline," a daily digest of political happenings that is subscription-based and delivered via the Internet.

Jarvis started his career in journalism while still in college. His first news job was as a radio reporter at WMVY(AM) in Vineyard Haven, Mass. It was a tiny station that allowed its summer interns to cover the events in the small town on Martha's Vineyard. After graduating from Colorado College in Colorado Springs, Colo., with a degree in English, Jarvis moved to "The Hotline" in Washington.

Forthright

"She was very up-front with the audience about her condition," the 32-year-old Jarvis said of his mother. "When she was there, she did 80 to 90 percent of the show, but there were times she couldn't, like when she had a stroke. I hosted alone then."

After Judy Jarvis died early last year, Jason continued as host of the show, renamed "The Jason Jarvis Show." Fifty stations carried it at its peak, 20

See JARVIS, page 40 ▶

PROMO POWER

Do You Respect Your Engineer?

Radio Is Losing Essential Staff — Its Engineers. Here's How to Keep Yours Happy and at Your Station

Mark Lapidus

I hear his war story from the weekend: "It's two in the morning and I get this phone call. It's Ed. He says we're off the air and that the remote switch won't turn the transmitter back on. I hear my wife mutter something like 'new job' from under the covers as I am getting dressed.

"I drive down to the transmitter site. On top of it all, it's pouring rain. And then, just as I get there, this big snake slithers by the door of the shack. It could not be worse. And it takes me four hours inside the transmitter before I figure out what's wrong. Turns out it's ... "

Handyman can

At this point, the general sales manager pops her head into the office to tell the chief — "Hey John? The toilet in the ladies' room is stopped up. Could you please fix it?"

Why is the only person in the building who has the amazing capability of tearing a transmitter apart being asked to plunge a toilet?

John, being the nice guy he is, smiles and tells her he'll get right to it.

But I'm confused: Why is the only person in the building who has the amazing capability of tearing a transmitter apart being asked to plunge a toilet? Answer: he's a radio engineer.

The purpose of this article is to convince managers of the need to think twice about how engineers are treated day to day and how their behavior sets the tone for the attitude of other employees.

I'm hoping also to offer a few suggestions about how marketing directors, program directors and promotion directors can interact better with engineers.

Essential

Your chief engineer should be a department head who reports directly to the general manager or owner. Even in a cluster situation where you have one director of engineering and several other engineers who report to him, these others still should have department-head status at their home radio stations.

Disc jockeys should be educated to realize that they shouldn't behave any differently with their chiefs than they would with the other department heads today. Sometimes this occurs because engineers are not included in department-head or promotion meetings.

Most times, though, the problem stems from poor planning on behalf of marketers and programmers. They forget that it takes time to order ISDN lines for remotes or that equipment shared among several stations in a cluster must be checked out or — when necessary — rented.

In the loop

One easy way to solve communication quicksand is simply to copy your engineering department on all memos involving event planning. Also, make certain that your updated calendar is either online for your engineer to access, or that you place a new calendar in his box at least once a week.

Disc jockeys should not delay in telling engineers about equipment problems in any of the studios. It's a lot easier and more convenient to fix equipment before an emergency! After they fill out the standard form for equipment problems, they should also leave a voice mail or send a quick e-mail to the engineer.

It never hurts to overcommunicate. When you're congratulating your staff for a job well done after an event, don't forget to applaud the engineering staff if they've contributed to the effort. Just like everyone else, engineers enjoy recognition and positive reinforcement!

Finally, make your chief part of your radio station "brain trust." They will offer a unique perspective that may very well give you the competitive advantage you need.

Why am I so concerned about these issues? We continue to lose great engineers to computer-oriented industries.

We need to wake up now and do our best to integrate better those without whom we would be literally off the air.

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

STATION SERVICES

Games to Build Listener Loyalty

Two new games designed to build audience are available from SCA Promotions: the "High-Low Game" and "eVault."

The "High-Low Game" offers a jackpot that listeners call in to guess its total, which a station announces is within a range, typically between $50,000 to $150,000. SCA randomly selects the winning jackpot amount within the station's range. The DJ tells each listener who calls in whether they are "high" or "low."

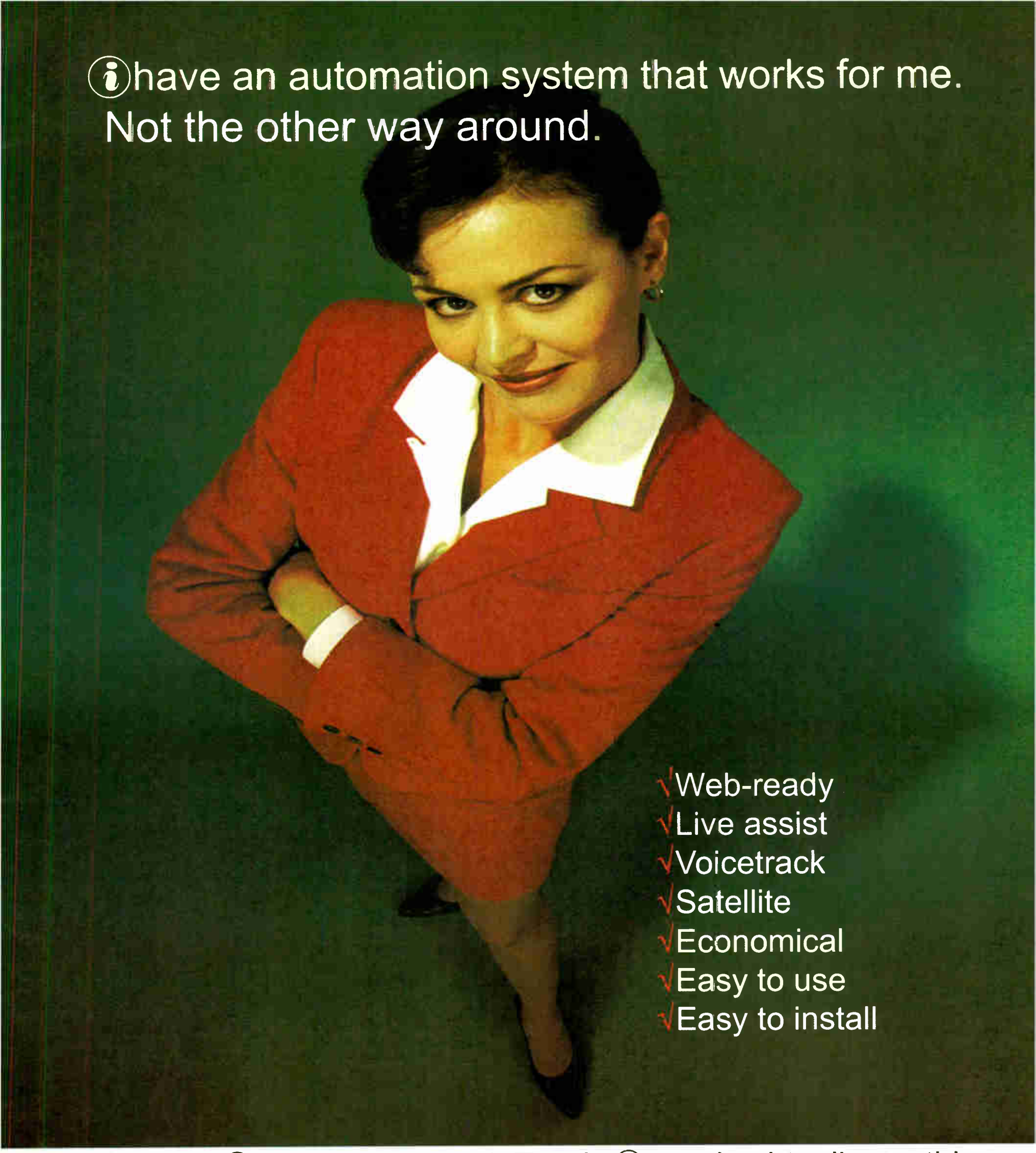
With each call, the jackpot is closer to discovery for listeners who stay tuned to catch all of the clues. SCA said that this game and "eVault" are ratings superchargers that help build audience during critical ratings periods.

The "eVault" game directs listeners to your station's Web site to spin four dials on an animated vault door. The correct combination pays from $10,000 to $1,000,000. With "eVault," SCA designs the game to serve a station's marketing goals including collecting demographic information, conduct listener surveys, building station Web site traffic (extending you brand) and building station databases while rewarding listener loyalty.

SCA provides ready-to-go promotions and conditional prize guarantees in a variety of themes. SCA said it offers a station bigger prizes for fewer dollars using promotions that capture listeners, extend station brand and attract sponsors.

Since 1986, SCA has coordinated the underwriting for more than $11 billion and paid out more than $65 million in prizes for promotions in a number of industries.

For more information visit the SCA Promotions Web site at www.scapromotions.com



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Radio Commercials for ... Radio!

Ken R.

It was the summer of 1965 and I was a teenager on my dad's boat in the middle of Lake Erie. My transistor radio was blasting a top 40 station that was playing hits like "Satisfaction" by the Stones, "Eve of Destruction" by Barry McGuire and "Mr. Tambourine Man" by the Byrds.

And then I heard the most incredible little radio drama unfold between my ears: The Royal Canadian Air Force was dropping a 10-ton maraschino cherry into Lake Michigan. I saw the entire thing in my mind and it was hilarious (see the script in the sidebar on page 40).

The enemy

Much later I learned that this was a commercial for the medium of radio created by humorist and iconoclast Stan Freberg for the Radio Advertising Bureau.

To most Americans in 1965, "the enemy" might have referred to the Soviets, but to the folks at the RAB, it meant "newspapers and television." Over the last 35 years, the RAB has created a number of clever radio spots and jingles, made available at no cost to member stations. The goal was simple: Convince print and TV advertisers to reallocate their budgets to radio.

Todd Carruth

Todd Carruth is media service specialist for RAB.

"That Freberg spot is still very highly thought of," said Carruth. "I have people calling me every week for copies."

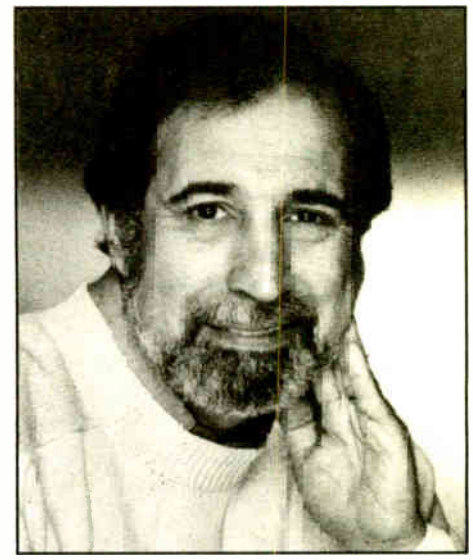
More than 5,000 stations belong to RAB, and in addition to receiving these "pro-radio" ad packages, members can also obtain other ammunition against competing media.

"Our members can call us anytime," said Christa Dahlander, vice president of communications for RAB. "We're also making spots available as MP3 files on the Internet now."

After the initial spots, other memorable promos followed. There was a great jingle called "Who Listens to Radio?" which was conducted by Quincy Jones and sung by jazz stylist Sarah Vaughan. Freberg also cut spots featuring a Pterodactyl taking a bite out of the Superdome and a robber who stole nothing but radios.

Six feet under

Dick Orkin began recording funny skits at WCFL(AM), Chicago, in the 1960s, including the saga of Chicken Man ("He's everywhere, he's everywhere!"). Orkin's skills were soon brought to bear on a number of amusing RAB spots including the tale of a naïve advertiser who wanted to put "282 facts" into a 30-second radio spot. The slogan for his cemetery: "Hidden Knolls ... conveniently located six feet under Cleveland."



Dick Orkin

TV funnyman Jay Leno voiced a number of promos in which improbable but highly visual situations were created. These included a man in a giant banana suit who played the flute and a poor soul forced to sit in row 187K of a crowded airplane next to a giant fish that drank red wine. These 30-second spots used only voices and sound effects but painted very vivid pictures. The campaign: "I Saw It on the Radio."

A relatively serious anti-newspaper pitch used a spokesman who said "If you advertise in the newspaper, you're hoping someone will read every page, every

See JINGLES, page 40 ▶

Promo

▶ Continued from page 27

According to Harris, any summer promotion calendar must cover three major dates: Memorial Day, Fourth of July and Labor Day.

"You want to make sure you've got the prime facilities locked down for those dates, as well as any other major community events in the market. Many facilities are buttoned up early," he said.

Title sponsorships

"It's very important for all department heads to hash these promotions out," said Barr. "Sales needs to know what to sell, can they have a title sponsor, what about other sponsors?"

A station certainly isn't limited to events it has done before. "Find a 'good' parade and get in front of it," said Harris.

Bill Barr

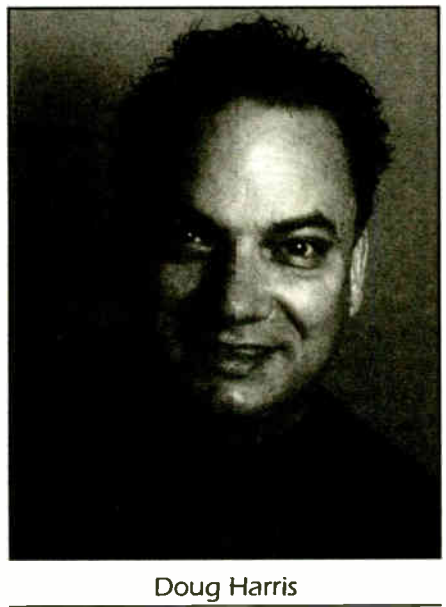
However, if a station is looking to launch a new event, Barr said, starting early is even more important.

"These are harder to sell to a sponsor because he hasn't seen it before. You want to give an estimate of attendance and look at similar events for comparison."

Sylvia Allen, president of Allen Consulting, a marketing consulting company, is author of "How to be Successful at Sponsorship Sales," a guide to selling first-time events. She wrote that a station's track record on these ventures is important.

"Study other first-time events to determine how effectively they met their sponsorship commitments," she advised.

Barr said that it is important to be honest and to have a strategy to keep the client happy in case the event doesn't meet your projections. While he said it doesn't have to be formalized in the agreement, your reputation for future first-time events is on the line.



Doug Harris

"I think anything in sales is a learning experience — especially with a first-time event."

As summer ends and planning begins in earnest for the next summer, Harris recommends the station evaluate the battlegrounds for listeners.

"Is it the beaches, malls, is it a big concert year? Once you've got that established, it's up to sales to identify where the money is."

Craig Johnston is an Internet and multimedia producer in Seattle and a frequent contributor to RW. He wrote about promotion strategies in the Feb. 14 issue.

RAB2001, Dallas Photo Gallery

RAB2001 was the biggest event the sales, management and leadership organization has ever produced — 2,200 attendees and almost 60 exhibitors in 120 booths participated in the four-day convention in Dallas in early February.

A poignant moment at the convention came as the Radio Advertising Bureau CEO and President Gary Fries introduced a memorial tribute video to Wayne Cornils, the late Radio Advertising Bureau executive vice president who died last summer. The RAB played the tribute to the crowd assembled for the opening ceremony breakfast. By the end of the convention, this year's "Radio Wayne" Silent Auction more than tripled last year's proceeds.

Cornils initiated the charity auction at the RAB2000 in Denver. The RAB renamed the auction in his honor this year. Proceeds benefit The Broadcasters' Foundation, which assists broadcasters and their families in times of acute financial need, and the Roaring Fork Conservancy, an environmental group in Colorado.

— *Laura Dely*

'Wild' Bill Goldsmith and Peggy Miles

Mike Veeck

The 'Radio Wayne' Silent Auction Crew was pleased with their record-breaking results. From Left: Celeste Champagne, Rickie Hall, Wendy Green, Chris Cornils and Cathie Bussi Cornils

RAB Radio Training Academy 'Top Guns' from left: Debbie Gallo; Kippie Romero, RAB; Mike Cody; Danny Boresow; David Watts; Lauren Cullen; and George Hyde, RAB

Jeff Smulyan, Emmis Communications CEO and President *and* RAB Radio Executive of the Year

Sandy Johnston, president, Johnston Management, led the 'Making the Internet Work Locally' session.

Wayne Brown, left, chairman of the RAB2001 planning committee and RAB President and CEO Gary Fries prepare for the opening ceremony.

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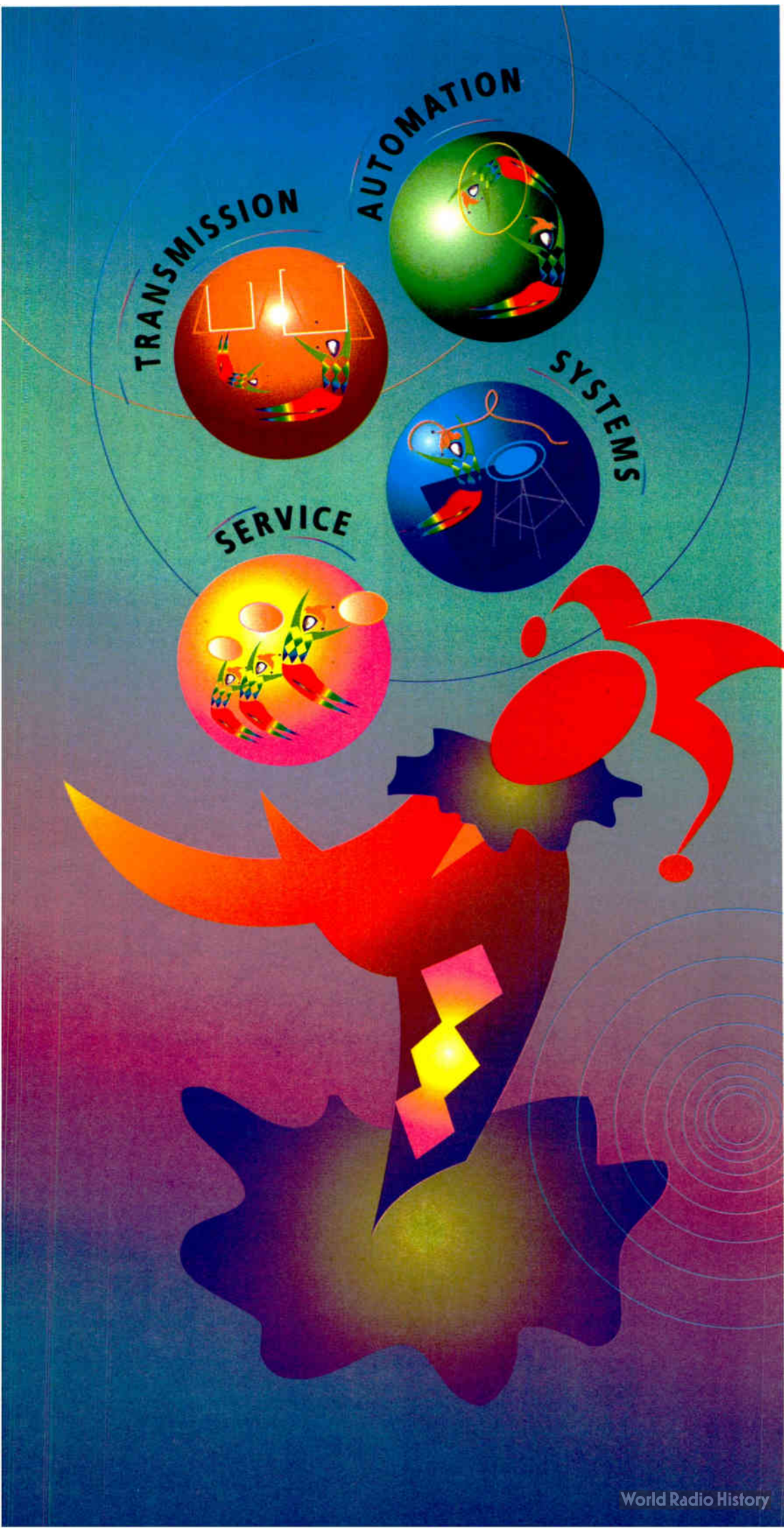

Taking care of today's broadcasting needs while moving toward a digital future is a tough juggling act. You need to maintain and, perhaps, upgrade current systems. Maybe you're even contemplating complete station makeovers. Fortunately there's a company with the resources and dexterity to help you maintain your balance: Harris.

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Harris has everything from replacement parts for your current transmitter to a new analog or digital transmission system.

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Who but Harris offers everything from a single console to the design and installation of entire radio, TV, and mobile studios? Come see our line of DTV products to help you manage your entire system.

Service

Harris installs, maintains and repairs everything it sells. And our broadcast training centers are available to make your team as self-reliant as possible.

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HARRIS

1980s Music Is the 'It' Format Now

Ken R.

Which radio format grew almost 1,000 percent in the last 12 months? Here's a clue: Its musicians sport huge hair, glitter, tight spandex and lots of make-up. And that's just the *guys*!

Yes, fans of A Flock of Seagulls, Duran Duran and Boy George rejoice: The '80s are back!

"A year ago I would guess there were about five of these stations," said Steve Apel, vice president of research and industry analysis for M Street/Media Market Resources. "Now there are more than 40 of them."

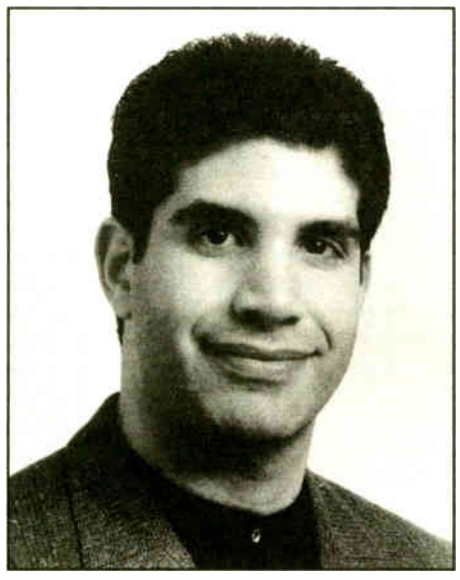
San Diego even has two stations playing '80s music — Jefferson Pilot Communications' KBZT(FM) and Clear Channel's KMSX(FM).

New metrics

Arbitron has rated Internet radio for about a year. The company has devised a new metric to measure online listening, "aggregate tuning hours," or the sum total of all hours that listeners tune to a given station.

In October 2000, NetRadio's '80s stream placed second out of more than 2,000 stations rated with 269,000 ATH for the month. (NetRadio was unable to be rated accurately in November 2000, Arbitron's most recent ratings available, due to a technical problem with its server.)

NetRadio's '60s format came in 22nd and their '70s format showed up in the 39th place out of Arbitron's October Webcast ratings. NetRadio is an Internet-only radio service streamed by Akamai and iBeam Broadcasting (*www.netradio.com*).



Robert B. Taylor

The Windy City has had an interesting history with the format. Robert Feder, television/radio columnist for the Chicago Sun Times, has been watching the scene.

"Big City Radio owned WXXY(FM), 'The '80s Channel,' since August of 1999 but their suburban signal didn't really cover the metro area well," said Feder. "Then Clear Channel came in with WUBT(FM) and began playing a rhythmic oldies format. That's why WXXY threw in the towel and went Spanish."

While WUBT was profitable, management felt it had limited growth potential so they switched to a contemporary hit radio format. Now the only '80s station in Chicago is WZZN(FM), "The Zone," formerly WXCD(FM), which flipped from a classic rock format last November.

Is it the coffee?

Apel believes that '80s phenomenon began in Seattle in December 1999 when Infinity's KYCW(FM), a country station, flipped overnight to KYPY(FM), an '80s station.

KYPT — "The Point" — is currently rated third by Arbitron in the 18-to-34 and second in the 18-to-49 demographic, Monday to Sunday, 6 a.m. to midnight.

"Stations are filling those market holes with '80s music," said Apel.

Dawn Marie

And Apel said that currently there is an "edgy," trendy association with the '80s format.

"There's an 'oh, wow' factor when an '80s station first signs on," said Apel. "Because this music was formerly buried within other formats playing a lot of music people didn't want. The question is now 'when will it burn out?'"

Inventive

"I think the '80s are a popular time period because of the sheer creativity surrounding the music," said Dawn Marie, designer of *www.80music.about.com* an '80s Internet fan site. While users won't find streaming audio at this site, they will find trivia, contests, artist and chart information as well as links to streaming sites in that format.

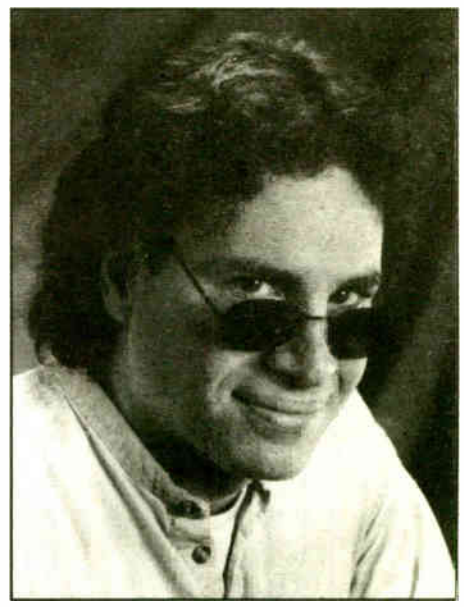
Marie cited the punk revolution of the '70s as an influence on the style.

"You also had a lot of women beginning to write and perform their own tunes," said Marie. "Bands like the Go-Go's proved it was possible for women to be in complete control of their music."

Randy Kabrich is president of R.M. Kabrich & Associates, an independent radio consultant based in Tampa, Fla. He has overseen a number of '80s format flips for Cox Radio Inc., Beasley Broadcast Group and others.

"The research tells us the niche is there," said Kabrich, "but we don't (yet) know how big the niche is." Kabrich has seen success in large and small markets in the 25-to-54 demographic.

"It's not a 12-plus format and it's probably not a No. 1 format," said Kabrich, "but it will get you a good share in a demographic where you can make some money."



Kid Kelly

The biggest obstacle to programming the format is researching the music, according to Kabrich.

"Each market is very different ... there is no 'safe' list of songs." Kabrich believes that the success of a particular artist or song depends on what the top 40 stations in that market were playing 15 or 20 years ago.

He also said that the format seems to garner about the same percentages of male and female listeners "and it's always a slam-dunk with the sales department," said Kabrich.

One of Kabrich's newest recruits into the '80s club is Cox station KHPT(FM) in Houston, programmed by radio veteran Johnny Chiang.

"We had our first book and it was tremendous," said Chiang. "We kept the flip a secret from everyone until the moment we switched formats." KHPT features a live personality in afternoon drive, but the station will take its time filling in people during the other dayparts.

"Our station, 'The Point,' is very rock-oriented," said Chiang. "We tested the full spectrum including pop, alternative and dance songs and rock tested best."

Chiang believes the '80s format has good long-term potential.

"It's unlikely to burn out anytime soon, because after all, classic rock is still around, isn't it?"

Syndicated formats

Fans of '80s music will be able to hear their favorites on their computers, their radios and soon in their cars as well. Sirius Satellite Radio is one of the two major satellite music providers going online this year. Dennis Falcone is format manager of "I-80," Sirius' entry in the race.

"The adult contemporary stations don't have much new material and people in the 35-to-44 age group really love Michael Jackson, Prince, Madonna and Billy Joel," Falcone said.

I-80 has at least 1,000 songs in rotation covering all the genres of '80s music including pop, dance and rock, according to Falcone. He said that the channel will feature Phil Collins, Huey Lewis, Whitney Houston and The Police.

Sirius is running this format in "practice mode" as the network runs quality

See 80s FORMAT, page 38 ▶

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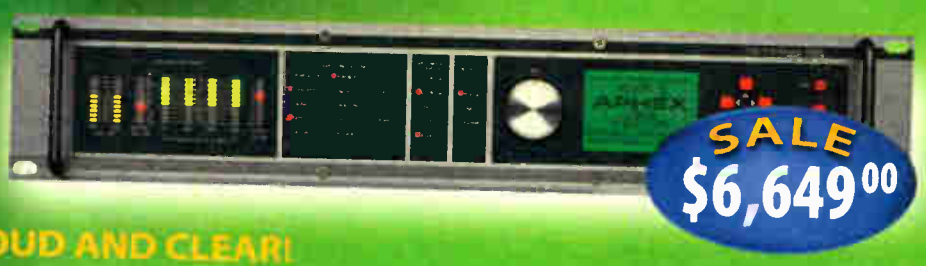

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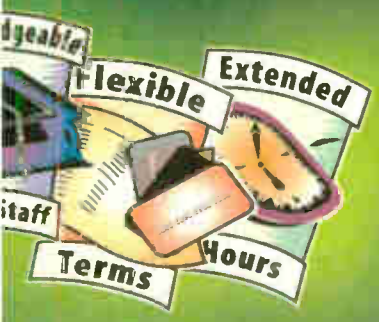

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Gentner DH20 (Digital Hybrid) List $995.00 ONLY $925.00
Gentner DH22 (Dual Digital Hybrid) List $1,595.00 ONLY $1,485.00

80s Format

▶ Continued from page 34

assurance tests of their studio transmission and transaction management systems. The company plans to air I-80 by this summer.

Steve Young, Jones Broadcast Programming's director of rock and pop programming, is keen on the potential of his '80s format, "Rockin' '80s." Young said broadcasters are looking at the format as an option in cluster strategy.

"We have eight or nine stations on it right now and the format is totally hard-drive delivered," Young said. "We can provide music rotation and dayparting, right up to a full consulting package."

Jones offers various musical sub-genres within the '80s umbrella that can be shaped to suit what research shows the individual markets require. The format usually provides about 450 songs in rotation.

Young predicts that this format will have at least a two-year cycle.

"And it depends very much on the other elements of the station," said Young, "including personality, promotions, marketing and contests."

Is there any downside to a station deciding to grab the '80s wave?

Fans of A Flock of Seagulls, Duran Duran and Boy George rejoice: The '80s are back!

Nina Blackwood

"It may be too narrow a format for some markets," said Young. But can it be No. 1? "Probably not except in the 25-to-34 demographics, but in a cluster situation it's good to use against a competitor who is playing classic rock or a hot adult contemporary station playing a lot of gold."

Young also cautions that it may take a while for the format to grab hold.

"Be prepared to make constant music updates and give it three to six months to have an impact," said Young.

Ahead

Arguably the first of the syndicated '80s shows was produced by Kid Kelly at Infinity station WHTZ(FM) in New York.

"Backtrax USA" host Kelly pitched the idea in the early 1990s to every major syndicator "and we were turned down every time," Kelly said.

"We were definitely ahead of the curve because at that time, stations like WBBM(FM), Chicago, had no place for an '80s show, which is why they and everyone else passed on it."

Kelly was convinced that there was a market out there so he took every dollar of his savings and dedicated it to getting the word out.

"I was about ready to mortgage my house or give up the show," said Kelly. "We finally formed our own company called Dats-rite Productions and we are now proudly represented by Premiere Radio Networks, a division of Clear Channel Communications."

The show is heard on about 250 stations.

Rob Taylor, Taylor Broadcasting president, also syndicates a show in this format. The PD of Paman Broadcasting station WHUD(FM), Tom Furci, is host of the show, "Magic of the '80s." He said the show achieves double-digit ratings on his local station in upstate New York.

"We cater to the listener who enjoys softer material," said Taylor. "This would include artists like Barbra Streisand, Neil Diamond, Elton John, Air Supply and Billy Joel." The program features news clips from the era to illustrate what was going on at a particular moment in the decade as well as artist interviews in each show.

Other popular '80s syndicated shows are United Stations' "Absolutely '80s" featuring ex-MTV Vee-jay Nina Blackwood and "Ultimate '80s," produced by NBG Networks.

There's no doubt that the '80s are back in a huge way. But will it last? In the words of pop icon Bobby McFerrin, "Don't Worry ... Be Happy."

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Jarvis

▶ Continued from page 27

are still with it. Jarvis sees that count beginning to climb again.

The Jarvis describes his show as a mix of caller-driven "hot" talk (the sort of thing that generates talk around the water cooler at work), opinion and newsmaker and celebrity interviews.

Surprise

"You're not going to hear a standard opinion out of my mouth. Every day I try to surprise people. I don't just take an issue and then arbitrarily pick the third way. My mother really cultivated quite an independent streak."

Jarvis counts John Cusack, Sen. Joseph Lieberman, B.B. King and James Patterson as some of the memorable guests he's had on the air since taking the show over solo. And he doesn't have to pause to think of his most memorable show.

"The first show back after my mother died, I told the audience and opened the phone lines. For three hours listeners talked about my mother and shared experiences about death in their own families."

Bruce Bond, a producer at Tacoma, Wash., station KLAY(AM), which has held onto the program, said that listeners had a gradual transition from Judy to Jason.

"We had always had good listener response with Judy and in the end Jason was doing a lot of hosting. But we continued to get a favorable response."

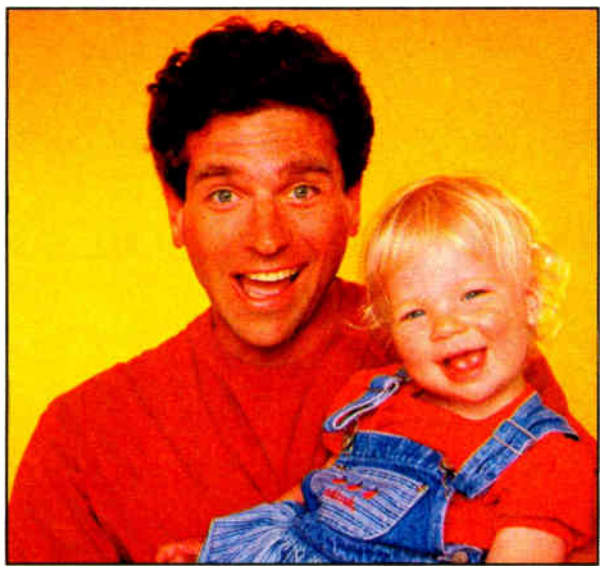
Jarvis considers his mother his mentor.

"We shared a lot of ideology," he said. "However, she was from the Kennedy era and considered many things to be possible. I'm a lot more cynical."

He credits his job with "The Hotline" for some of that cynicism.

"I had always been a political junkie and this gave me a wonderful exposure to the political process. But it did make me more cynical of government."

Jarvis sees other differences between mother and son on the air.



Jason Jarvis and His Daughter, Alexandra

"She saw things as very black and white. She had very strong opinions. I think I'm a little better able to listen to both sides of an issue."

He said listeners seem to like his flexible approach.

The start

His mother's show began on Infinity's WBZ(AM) in Boston and grew slowly at first. Jarvis said it kind of shot up all the sudden in 1998, but there was a lot of work before that.

"You look at most successful radio talk shows — Rush Limbaugh, Laura Schlessinger — they had a long run before they made it big. The 'overnight sensations' already had name recognition when they got to talk radio: Oliver North, G. Gordon Liddy. They're good hosts, too, but they were well-known when they hit the air."

In that sense, Jarvis said he's fortunate to have inherited from his mother the 20 stations he's got now. Jarvis broadcasts live from the Connecticut School of Broadcasting just outside of Hartford, Conn. And he has big plans.

"My goal is to have strong stations in all of the top-50 markets," Jarvis said.

He sees the development of the Starguide III satellite receiver system as helpful to his independently syndicated show.

"With Starguide III, which we've just switched to from SEDAT (satellite system), a station can pick up the show any time in the 24-hour day. We produce the show live from noon to 3 p.m. Eastern time and that has us up against some real heavyweights, like Rush Limbaugh. This gives stations carrying us more flexibility."

The program is also about to re-launch its streaming Web presence.

"We were up on BroadcastAmerica, but they went into bankruptcy. Right now we're evaluating new options for streaming our signal."

Jarvis lives in West Hartford with his college sweetheart, now his wife, Tamara and their young daughter, Alexandra. A dog named Coal and an old cat named Sid round out the household.

Craig Johnston is an Internet & multimedia producer in Seattle. and is a frequent contributor to RW.

Write to him via e-mail at Craig@CraigJohnston.com

Jingles

▶ Continued from page 30

column, every word, flipping the pages with inky fingers searching for your ad. Who has time to do that?" Radio was then touted as the best way to reach busy people in their cars when the listeners' attention is easy to grab.

"It's surprising how many of these older spots are still applicable today," said Carruth. "And they still have tremendous impact."

Now featuring

RAB member stations can request copies of these spots by calling (972) 753-6727.

Over the last several years, RAB developed campaigns using the theme "Radio Gets Results." The most recent series is contained on an enhanced CD produced with the cooperation of Broadcast Music Inc. that features a set of jingles created by BRg MusicWorks, Premiere Radio Network's music library/jingle division.

When you pop this disc into your ROM drive, you can access more than

Christa Dahlander

2,000 Windows 95/98-compatible print testimonials and success stories, in addition to the BRg jingles. Musical artists such as Graham Nash, Faith Evans and John Sebastian also are heard in clips that proclaim the magic of radio.

Ken R. wrote about tips from studio furniture makers in the Feb. 1 issue.

A 10-Ton Cherry Drop for Radio

Announcer (Paul Frees): Radio? Why should I advertise on radio? There's nothing to look at, no pictures ... .

Stan Freberg: Listen, there are things you can do on radio that you couldn't possibly do on TV.

Announcer: That'll be the day.

SF: All right, watch this: *(clears throat).* OK, people, now when I give you the cue I want the 700-foot mountain of whipped cream to roll into Lake Michigan which has been drained and filled with hot chocolate. Then the Royal Canadian Air Force will fly overhead towing a 10-ton maraschino cherry which will be dropped into the whipped cream to the cheering of 25,000 extras.

All right, cue the mountain! *(huge sound effects),* cue the Air Force! *(Flyover sound effects),* cue the maraschino cherry! *(Whistling falling followed by gooey splash sound effects),* okay, 25,000 cheering extras! *(Applause sound effects.)*

Now, you wanna try that on television?

Announcer: Well ... .

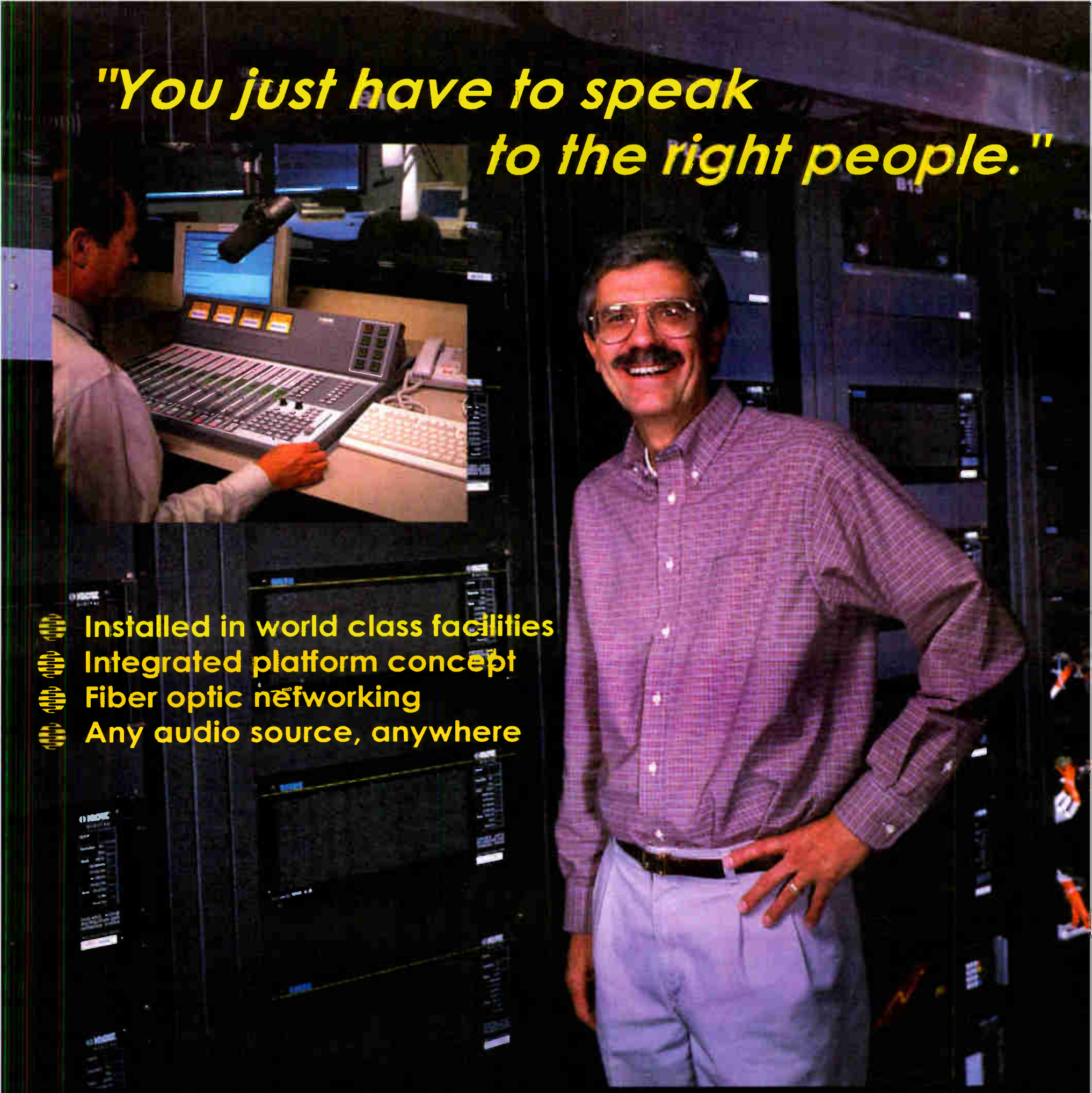
SF: You see, radio's a very special medium because it stretches the imagination.

Announcer: Doesn't television stretch the imagination?

SF: Up to 27 inches, yes.

Copyright 1965, Radio Advertising Bureau

"You just have to speak to the right people."



- Installed in world class facilities
- Integrated platform concept
- Fiber optic networking
- Any audio source, anywhere

"When faced with moving seven major radio stations into one consolidated facility, we suddenly realized the limitations of using a conventional analog approach," says Jan Chadwell, AM Chief Engineer, Clear Channel Denver. "KLOTZ provided the solution with their digital consoles and VADIS platform. We were able to consolidate the majority of the sources and destinations in one large master rack room."

"KLOTZ allowed us to achieve in eight months what would have taken us two years had we gone analog. Performance has been beyond anything we could have anticipated. The flexibility, ease of use, low maintenance, and great factory support have reinforced our decision. Thank you KLOTZ!"

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How to Beat Cybersquatters

With the Help of the United Nations, You Can Get Back Your Station's Call Letters Online

David A. Milberg

Do you own your own call letters? Think again. In the cyberworld, someone else may have grabbed them without your permission — but there is hope.

Station managers are often surprised to find that *www.yourowncallletters.com* is already taken.

So is *www.yourowncallletters radio.com* and even *www.yourown callllettersFM.com*

Someone got there first and they are the master of your domain. They already have a site with your call letters and what a surprise — they are willing to give them back to you ... for a fee.

Despicable

These are cybersquatters. The Federal Communications Commission can't do squat about them, but not widely known by many broadcasters who are just venturing into cyberspace, the United Nations can.

Yes, that's the same United Nations that works for world peace. Now the United Nations has jurisdiction to bring legal peace to cyberspace.

"The Internet Corp. for Assigned Names and Numbers, known as ICANN, is a private, not-for-profit entity that was created to govern the Internet, including domain-name disputes," said Tom White, an intellectual property partner at the Chicago law firm Schiff Hardin & Waite.

To date, ICANN has authorized four organizations to provide domain-name dispute resolution services. One of these is the World Intellectual Property Organization (WIPO), a U.N. agency.

White said ICANN-approved organizations that resolve domain-name disputes, such as the WIPO, follow the Uniform Domain Name Dispute Resolution Policy, or UDRP, to settle cyberspace spats.

All such entities, such as Network Solutions Inc. and Domain Bank Inc., that register .com, .net and .org top-level domains, now adhere to the UDRP.

Unless a station or the alleged cybersquatter choose to fight it out in a court of law, the UDRP determines how one of the ICANN-approved domain-name dispute resolution organizations will resolve any domain name debacle.

According to White, there are three basic parts to the UDRP test for settling cyberspace squabbles.

These involve:

1.) Showing that your station owns a trademark and that the domain name used by someone else that is identical or "confusingly similar" to your station's trademark;

2.) Showing that the domain name holder (a.k.a. cybersquatter) does not have any legal rights (like a registered trademark) or legitimate business interests in the domain name; and

3.) Showing that the domain name holder is using it in bad faith.

White emphasized that the "bad faith" test usually is the sticking point in a domain-name dispute.

"One of the best ways to show bad faith is to present evidence that a cybersquatter has offered to sell the domain name back to the legitimate enterprise, at a price higher than the cost to register it," White said.

"Cybersquatters are getting crafty, though, and often try to get the trademark owner to make an offer to them."

White said the trademark owner has to show evidence on both of the other two tests as well — relating to "confusingly similar" domain names, like *www.yourcalllettersFMradio.com* instead of *www.yourcalllettersFM.com* and not having a legitimate business or legal interest in the name, such as a trademark or trade name.

White said, "With cybersquatters who registered a set of call letters just to hold a station up for money, or to use the domain name for an unfair purpose, proving these other two elements usually is easy."

While the most highly publicized domain-name disputes settled in this way have involved famous names such as Julia Roberts, Jethro Tull, Jimi Henrix, Nike and Microsoft, White's research uncovered a couple of disputes involving radio stations.

In one case, Milwaukee Radio Alliance station WLUM(FM) in Milwaukee, used the UDRP to get back the domain name wlum.com.

Tom White

A competing station in Milwaukee had registered it and was using the domain name to direct traffic to its own Web site. The UDRP panel found that using the domain name to misdirect Internet users looking for WLUM's Web site was in bad faith.

One lesson from the WLUM case, according to White, is to register your call letters as a trademark. WLUM had some difficulty proving to the UDRP panel that it owned trademark rights in its call letters, because WLUM had not registered the call letters as a trademark and usually advertised the station as "Rock 102 One."

"Just having call letters doesn't necessarily mean that you own trademark rights in them," said White.

Global fiends

In another case, the British Broadcasting Corp. obtained the domain names bbcdelondres.com, bbcenespanol.com, bbcenespanol.net and bbcenespanol.org through a UDRP proceeding. An individual in Venezuela who registered the domain names was framing the BBC's Spanish language Web site on his bbcdelondres.com site, selling banner advertising and presenting the content as if it was the BBC's.

The individual also offered to sell the four domain names to the BBC for $75,000. The panel found that both his improper and misleading use of the content from the BBC site and his offer to sell the domain names for more than his out-of-pocket costs showed bad faith.

Radio station IRIE(FM), in Kingston, Jamaica, failed to obtain the iriefm.com domain name from the company that registered it, but only because the station didn't pay enough attention to the UDRP procedures.

David Milberg

The panel found that IRIE owned strong trademark rights in its call letters and that the domain name probably had been registered in bad faith. The panel refused to transfer the domain name, though, because IRIE did not meet the second element of the UDRP test — that the registrant had no rights or legitimate interest in the domain name — even though the panel had specifically suggested the kind of evidence that IRIE could submit.

"The iriefm.com case shows how important it is to follow the UDRP rules carefully," White said. "The panels usually want to be sure that all the formalities are met before they are willing to transfer a domain name."

So, if your station has a domain-name dispute, White said that it is simple and inexpensive to get your case heard at the WIPO or other UDRP organizations.

"The WIPO's systems and procedures are designed to simplify domain-name disagreements and most if not all of the required filings can be done online."

These can be accessed by visiting the WIPO Arbitration and Mediation Center Web site at *www.arbiter.wipo.int/domains/index.html*

Broadcasters browsing the site can find out how to file a case, as well as see a listing of every case the WIPO has decided and statistics about the outcomes.

According to White, complaints to the WIPO against cybersquatters have a good chance of succeeding. He said case results from the first nine months of 2000 showed that of 1,291 cases filed, 591 decisions were rendered and 467 of those were successful actions against cybersquatters.

"That's a 79-percent success rate — which is very high by most legal litigation standards," White said.

He said while the U.N.'s WIPO is fast at settling domain-name disputes, it also can achieve results fairly inexpensively.

"Typical in-court litigation can take years and cost tens to hundreds of thousands of dollars," White said. "But, to paraphrase the classic rock hit, 'Summertime Blues,' you can save significant time and money if you take your problem to the United Nations."

Such costs can be as low as $1,000, according to White, and the WIPO makes it easy to estimate charges in advance. Just check the fees page at the WIPO Web site listed above.

White added a word of caution for broadcasters who want to play lawyer at the U.N.'s WIPO.

"Although it's easy to file a case online, it still is very advisable to get the advice and counsel of an intellectual property attorney who is cyberlaw-capable."

STATION SERVICES

Uri Geller Returns to Radio

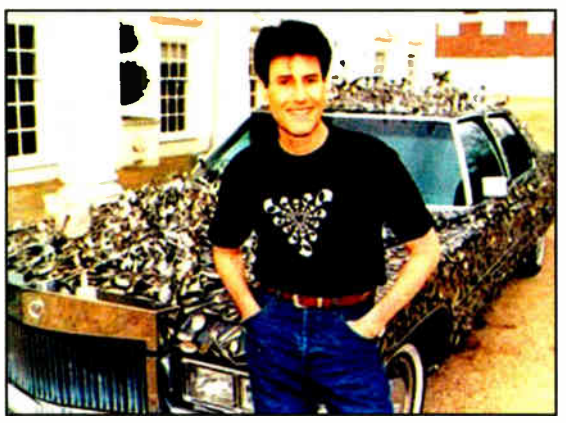
After a brief hiatus from the air, psychic Uri Geller is again in his English countryside radio studio, broadcasting his "ParaScience and Beyond" radio show.

Geller said his two-hour, nightly show covers extrasensory perception, mind over matter, unexplained happenings and unidentified flying objects.

Talk America Radio Networks offers "ParaScience and Beyond," Tuesdays through Fridays, from 1 to 3 a.m. Eastern time on a barter basis.

"Everywhere I go, people want to know more about mind power and the paranormal," Geller said.

Geller is the author of 12 books on the "paranormal." He is known for his ability to bend spoons and repair watches, apparently using only the power of his mind.



Uri Geller said he used only the power of his mind to bend the spoons that now decorate his car.

For more information on "ParaScience and Beyond," contact affiliate relations at Talk America Radio Networks in Las Vegas at (702) 795-8255 or visit the Web site at www.talkamerica.com

— Anita McCormack

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MANAGEMENT CORNER

Better Radio Biz From New Basics

Broadcast Industry Has Hidden Assets to Soften The Impact of an Economic Slowdown

Vincent M. Ditingo

While mired in an economic slowdown during the first few months of 2001, radio managers have an unique opportunity to stabilize revenue growth, due in large part to two of the medium's newer business fundamentals: digitalization and consolidation.

Today, the driving forces of digital technology and ownership consolidation provide a solid foundation for station management success.

The reason? Combined, these two dynamic forces create new operational efficiencies that take advertiser and listener service to a far higher level.

Blueprint

Radio's newly configured operational efficiencies combine the best characteristics of digital with those of consolidation.

In fact, a digital infrastructure is now a mandate for many station operators if they want to be an integral part of the mass media's current electronic marketplace.

Without question, this transformation from analog to digital makes on-air talent, along with program and music directors and production managers, more proficient at their tasks.

Investors remain enthusiastic about the long-term prospects for radio.

— Prudential Securities 'Media Quarterly'

Although the move to digital can be a hefty investment, it will almost assuredly pay dividends to station owners when terrestrial analog radio transforms into terrestrial digital radio.

At the same time, these initial costs can be amortized over several years so as not to have a dramatic impact on the company's bottom line. And, if the tealeaves are right, the shift to digital audio broadcasting could finally happen sometime in the next 12 months.

DAB

Totally digitized on-air and production studios include computerized playlist software, such as RCS Selector, and digital audio editing computers like the 360 Systems Short/cut2000, to name just two of many popular products.

Perhaps more important, digitization also means greater efficiency in ad scheduling. An increasing number of radio broadcasters receive their commercial spot schedules via high-speed digital phone lines and/or the Internet from two leading companies in the field: DG Systems, which recently merged with StarGuide Digital Networks, and FastChannel Network, which recently acquired SpotTaxi.

Commercial spots and their designated air times can be sent directly into a station's computer network for review and airplay. This reduces the number of discrepancies and make-goods that occur when logs are kept manually. Digital ad delivery also maintains inventory flexibility.

Internet

Our discussion of digitization of radio's infrastructure would not be complete without stressing the importance for local station operators to extend their brand name and programming with a Web site presence.

The Internet not only provides these opportunities, but it also creates another marketing platform for the commercial radio broadcaster to create inventory. (See *Management Corner*, RW, Feb. 1.)

Meanwhile, inching closer to a technical reality is the Portable People Meter, which is a new Arbitron method/technology that counts listeners digitally. The PPM was tested among 70 consumers in Philadelphia during January and February.

Radio, TV and cable operators all can use the pager-sized device that is worn by consumers throughout the day. It detects inaudible codes that broadcasters embed in the audio portion of their programming using encoders from Arbitron.

At the end of each day, participants place the small meter-like device into a base station that recharges it. Then the collected codes are sent via phone lines connected to the base station to Arbitron for tabulation.

The result is that broadcasters will be able to access a more precise measurement of their audience that will enable better understanding of how many ears have been exposed to which advertisements throughout the day.

For advertisers, this potential ratings device will take full advantage of radio's greatest marketing strength and long-time fiscal fundamental — *its portability*.

Several key advantages result from ownership consolidation. One is that clustering the inventory of commonly owned, same-market stations allows radio groups to dominate select demographic targets within a particular market.

While the rapid-fire activity of radio mergers and acquisitions that began with passage of the Telecommunications Act of 1996 has leveled off, a series of station deals continue to take place in the small- to medium-size markets.

Case in point: In mid-January, the investment firm of Forstmann Little & Co. announced it had reached a definitive agreement to purchase Citadel Communications Corp., a radio group owner that specializes in mid-sized markets, for $2 billion.

Upon completion of pending transactions, Citadel will own or operate 209 stations in 44 mid-sized markets.

BIA Financial Network confirms that the trend in small-market consolidation is strong.

For example, 86.4 percent of all radio stations in Youngstown-Warren, Ohio (19 of 22 stations) are consolidated stations while 78.9 percent (30 of 38 stations) of the radio stations in Albuquerque, N.M., are consolidated, according to BIAfn.

BIAfn defines a consolidated group as any two or more stations owned by the same broadcasting company in the same market. See accompanying chart.

The BIA data further underscores the importance of owning more than two stations in the same market in today's extremely competitive advertising arena. For example, BIA also reports that 68.5 percent of the listening audience in all Arbitron-rated markets tune to a consolidated station.

According to Prudential Securities' Winter 2001 Media Quarterly report released in January, "investors remain enthusiastic about the long-term prospects for radio."

Sweet

The Prudential report projects radio's share of advertising for all media to climb from 2000's estimated 6.5 percent to 10 percent of the total pie over the next five to 10 years.

In the report, James Marsh, the leading broadcast analyst for Prudential Securities, notes that negative analyst reports in fourth-quarter 2000 did not cause much damage to the radio group that his firm tracks.

Prudential tracks eight major radio groups including Clear Channel, Infinity, Regent Communications and Salem Communications.

"This tells us that investors have already come to expect the worst and are likely looking ahead to the second half of 2001," he said.

Digital technology allows radio station staff to be more proficient at their tasks.

Vincent M. Ditingo is an assistant professor of communication arts and coordinator of the radio program at the New York Institute of Technology. Contact him via e-mail to vditingo@aol.com

Consolidation Delivers Listeners

Market Rank	Market	Number of Consolidated Owners	Percent of Consolidated Stations	Total Consolidated Listening/Market
97	Youngstown-Warren, Ohio	3	86.4	99.7
194	Yakima, Wash.	3	78.9	99.7
242	Wichita Falls, Texas	2	77.8	97.8
92	Des Moines, Iowa	5	72.0	97.5
147	Macon, Ga.	3	79.2	97.2
154	Savannah, Ga.	3	77.3	96.9
36	Norfolk-Virginia Beach-Newport News, Va.	7	69.4	96.0
182	Cape Cod, Mass.	4	78.6	96.0
120	Madison, Wis.	4	69.6	95.8
72	Albuquerque, N.M.	4	78.9	95.5

Source: BIA Financial Network MEDIA Access Pro™

BIA Financial fn network

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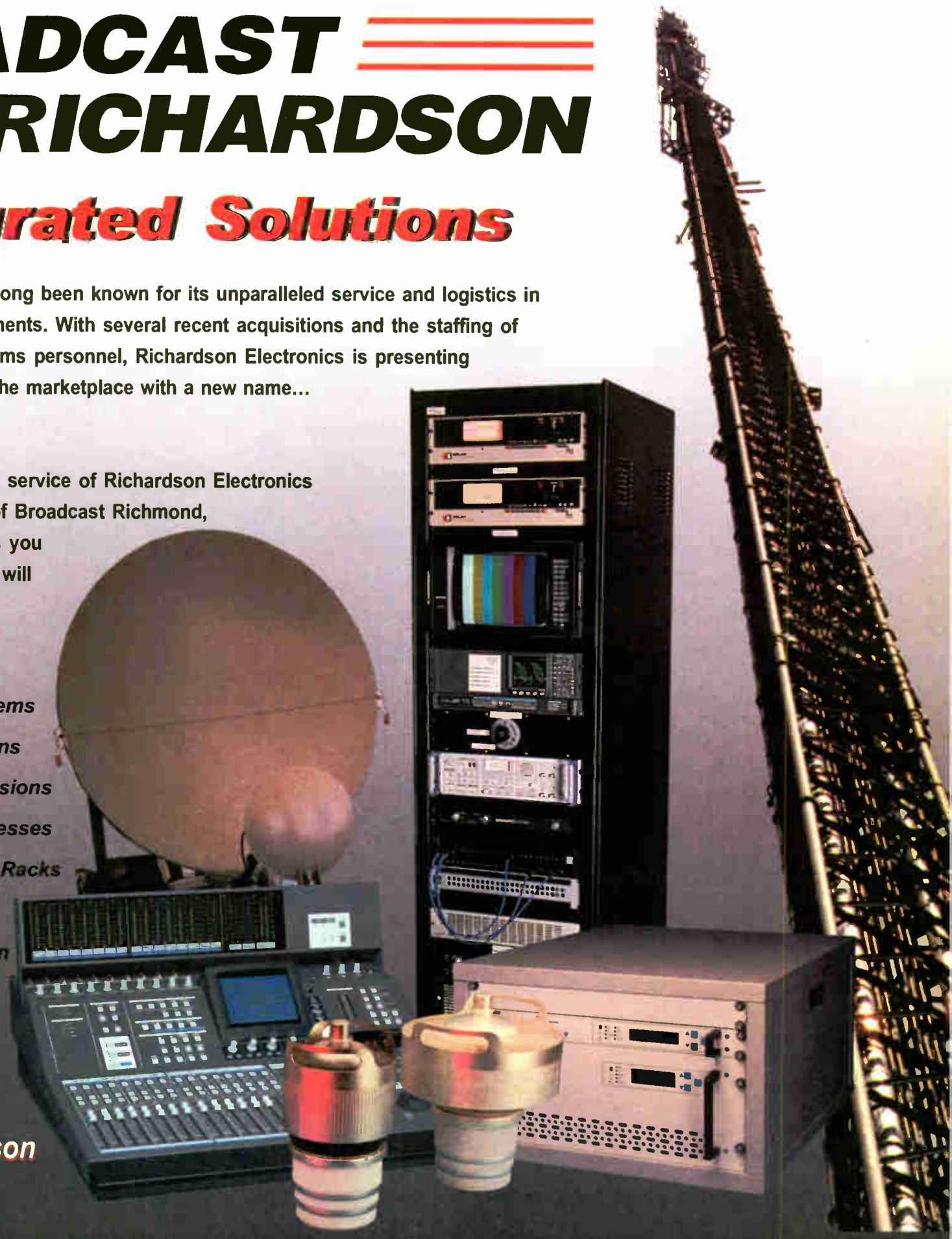

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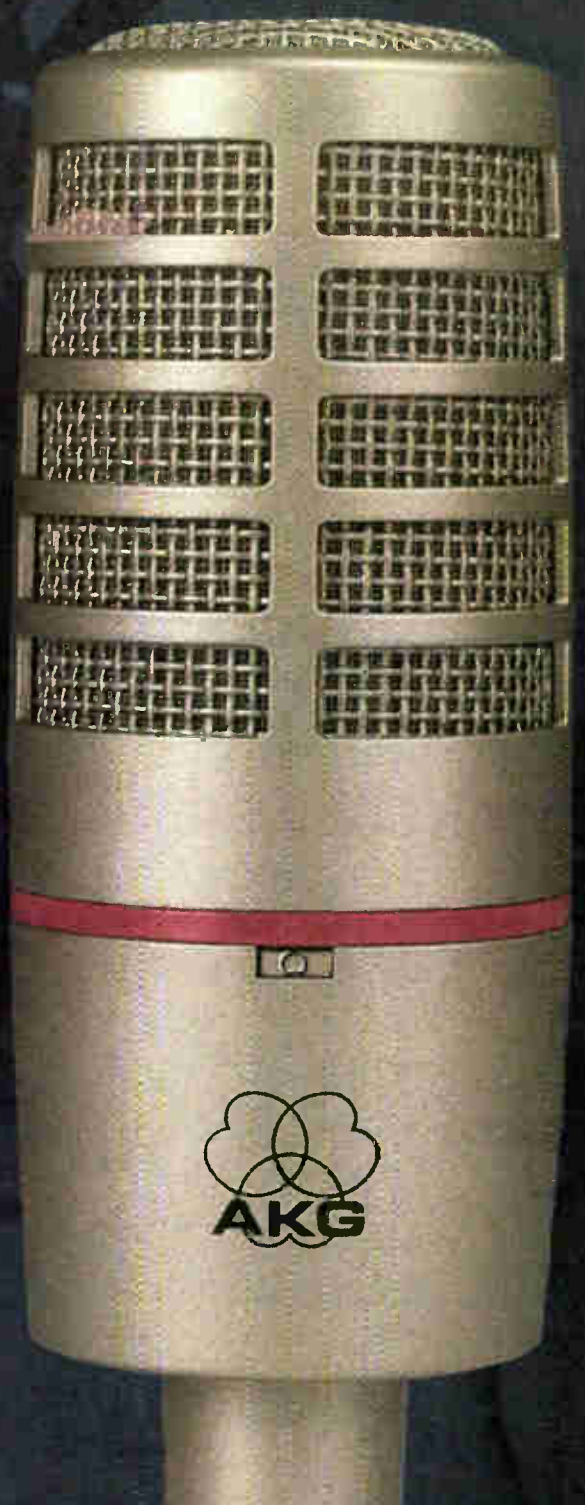

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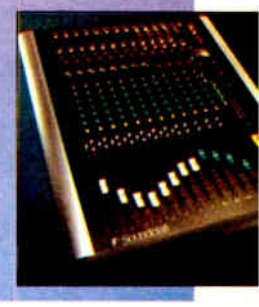


What's in the Cards for Audio

Bernard M. Cox

Once upon a time, a processing speed such as 1 GHz for a personal computer was a thing of theory.

Now you can buy a personal computer with a 1 GHz, Pentium III processor, 20 Gig drive and 128 MB RAM, running Windows NT, for $1,800.

Massive amounts of processing power are within easy reach. Soundcard manufacturers have taken advantage of that.

This processing power can be used to replace devices that were once necessary add-ons. For example, external audio compression/decompression (codec) units, though occasionally a better solution, might be replaced with software-only solutions. Internal software codecs can accomplish roughly the same results and promise to perform as well or better.

While the computer mentioned probably isn't the optimal machine on which to be creating audio content, most likely it will hold up. Companies know this and, as a result, the line between professional audio cards and high-end consumer cards has become blurred.

Crossover potential

"Radio stations in the U.S. have always turned to high-quality consumer products as an option," said Neil Glassman, president of Digigram.

"There is no denying that for some applications, off-the shelf sound cards will do the job. On the other hand, we are not naïve and demand more of our sound cards in mission-critical installations," he said.

"As the power of the host computer increases, we are offering more processing power by offering solutions that efficiently use both the CPU and the power of the soundcard."

Digigram hopes to make use of this processing power with the new miXart series of soundcards. The PCI cards feature multiple analog and digital signal paths with on-board processing, customizable editing and mixing software that can be integrated into applications.

Part of the allure of consumer soundcards was price vs. features and performance. Now these products have several features that were once only marketed for professional audio use, such as digital signal processing.

"As DSP and converter costs drop, soundcards will be more affordable," said Stephen Turner, vice president of AudioScience. "You will always pay a premium for a sound card designed especially for the broadcast environment, though — balanced I/Os, AES/EBU I/Os, DSP-based compression."

Charlie Hitchcock, co-founder of Frontier Design Group, feels he has the answer to the price drop.

"The glut of PCI soundcards — not all solid, by the way — has driven prices down," said Hitchcock.

Even as he recommends caution in choosing a sound card, Hitchcock does see a positive effect to the number of companies entering the soundcard business — accessibility.

miXart Soundcard by Digigram

"The ever-lower price of technology makes digital I/O sound cards — and related digital mixers and tape machines — much more common features in the broadcast community."

Robert Ellison, president of Syntrillium Software recognizes this trend of lower-priced cards but doesn't feel that a broadcaster necessarily needs a soundcard specifically aimed at broadcasting. In fact, he feels that purchasing a soundcard from a reputable consumer manufacturer may be a better way to go.

"There are plenty of broadcast applications that can be easily satisfied by mass-market cards that cost well under $100," said Ellison. "One key advantage in going this route is that support for popular cards — like the SoundBlaster Live — is always out in front. With each new version of Windows, the drivers are re-created and well-tested, whereas most high-end cards will be left behind.

"Even among high-end cards, there are plenty of excellent and affordable options from companies like Echo Corporation and Frontier Design Group."

Platform support

Often the choice of an audio card depends on the chosen platform — i.e. Windows or Mac — and how much processing power is needed for the applications that the PC will run.

"We develop for all 32-bit flavors of Windows — Windows 95, 98 and ME

See TRENDS, page 52 ▶

PRODUCT EVALUATION

Matrix Hits the Streets Running

Paul Kaminski

The art of sending high-quality audio over dial-up phone lines is difficult at best. I was told that the Comrex Matrix should reduce some of that difficulty.

The unit is a POTS codec. That means the send unit will digitize audio so it can ride over conventional telephone lines via a modem, and the receive end will convert the digitized data stream back into audio.

If this explanation sounds familiar, it should — this is how the company's HotLine and Vector work as well.

Comrex equipped it with a DB-25 port where you can insert a module for an ISDN installation (G.722, G.722 Turbo and ISO/MPEG Layer III) or for a GSM cell phone. The ISDN modules are due out this spring and the GSM module will roll out later in 2001.

Right now, the Matrix is compatible with the Vector and HotLine, and if all else fails it can be used as just a POTS codec.

In the trenches

But Matrix is designed to be an all-in-one unit, with more than just codec features.

The field unit includes a two-input mixer, an additional input for a fixed-level mini-plug input (MD, cassette, etc.), headphone output and a balanced line-level output. The studio unit does not include the mixer or an interface for the cell phone, but does all the other features.

The unit has an optional Ni-MH battery, providing seven hours of primary

Comrex Matrix Studio and Portable Versions

power or hot backup when the AC adapter is connected. Both units have mini-jack connections for relays. These connections can be used to trigger a switch to operate automated features — a recorder or a tally signal for the board-op.

A feature called Store and Forward may save hassles in a control room or operations center. This can record 9 minutes 45 seconds of 15 kHz audio and upload it in a manner similar to e-mail. Both the send and receive ends of the Matrix are user-configurable to accomplish the appropriate store/forward function.

This feature is useful when producing drop-ins over a connection of dubious quality. The store-forward idea is good for busy newsroom operations.

A report could be recorded and uploaded to the studio where the operator could download or play the audio file. The file will stay in memory until it is erased deliberately.

In practice, the audio quality is more *mid*-fi than hi-fi, and music might not be appropriate over this part of the system. And the feature will only work with a properly configured unit.

The Matrix will pass 14 kHz audio with a connect rate as low as 24 kbps on a line in Music Mode. We made test calls to the Comrex Matrix dial-up test nodes in Massachusetts and in Great Britain. Even from our line that is five miles from the central Verizon office, the unit connected solidly at 24 kbps on both occasions.

In Voice Mode, the Matrix will pass

See COMREX, page 54 ▶

PRODUCT EVALUATION

Orville Makes a Sonic Boom

Eventide Still Holds High Place in Effects Processing; Orville Enables Users to Create Multiple Environments

Alan R. Peterson

This is the first part of a two-part review for Radio World.

The Orville is the latest in a line of innovative effect processors from Eventide Inc. of Little Ferry, N.J., going all the way back to the days when the product lines were the Harmonizer, the Instant Flanger and the Omnipressor, and the company carried the name Eventide *Clockworks*.

Back then, having a Harmonizer in the rack meant you had arrived. Graphic EQs and an Orban spring reverb were nice, but a Harmonizer in the studio told the world "you-da-man." That statement still holds true today.

With the Orville, Eventide brings to the feast a high-quality, 24-bit, dual-DSP processor with all the goods: reverb, ring modulation, flanging, delay, filtering and a heckuva fantastic sampling feature.

This much power comes with a price of $5,695, but folks wanting this kind of processing power will pay it happily for the edge it gives them in the studio.

Front-Panel Control Interface

Neat effects quick

While radio's approach is "get it out the door fast," the dedicated production person will want to leap beyond the factory presets and explore new possibilities. So this review, like the Orville manual itself, is being presented in two parts: operations and programming.

For the first part, we will concentrate solely on operations and we will delve into the possibilities presented by programming in the next issue.

The Orville faceplate maintains the familiarity offered by its siblings, the H3000 and DSP4000 — a quartet of soft keys with a concise display panel, program and parameter buttons, a direct-entry numeric keypad and that big beautiful Eventide KNOB.

The KNOB — capitalized even in Eventide literature — has been a fixture since the original model 910. The dial is far more satisfying and intuitive than nudging a set of numbers with a keypad, although the Orville gives you the option of doing either.

The back panel is decked out with jacks for AES/EBU or S/PDIF digital leads, balanced or unbalanced analog lines, MIDI devices and a foot pedal arrangement to modulate parameters in real time.

Rear Panel of the Orville With Analog and Digital Connections

Orville chats with friends

An RS232 serial port allows the Orville to talk to computers, providing mass storage and backup of programs and presets. At face value, this does not seem a big feature for the radio production studio, but you would be surprised how powerful this will be when creating your own programs.

No computer? No problem. Save your masterpiece presets to a MIDI sequencer or PCMCIA RAM card. The slot is under the keypad.

Note there are four analog Ins and Outs. Remember, this is a dual-DSP box and you may use one Orville to fulfill two purposes simultaneously. Internal routing of the DSPs lets you run the Orville in series or parallel configurations.

The manual shows no less than nine different ways to combine analog and digital inputs and routings to accomplish complex processing tasks.

Even the "quick-start" section of the manual encompasses pages 22 through 34. Where many effect boxes can put their entire quick-start directions on a single laminated card, it really does take 13 pages to get to know the Orville. But don't let this get in your way.

Here is what you need to know to start. First, tap the setup key (to the far right above the power switch) until you get to the audio menu. Set your audio input, either analog or digital. A digital input will sync up the Orville's clock to the incoming sample rate. Otherwise, you will need to select an internal sample rate, nominally 44.1 or 48 kHz.

Do not set the Orville's sample rate any higher than you have to. For one thing, nobody will hear 96 kHz over car speakers or clock radios. Plus the unit must borrow power from system resources and several programs will not run at higher clock speeds.

The presence or absence of a lightning bolt icon in the display shows which programs are affected.

Make noise

Decide on the desired routing scheme — which inputs and outputs get directed to which DSPs — then fine-tune input levels. No sense having a state-of-the-art processor if distortion is going to creep in and wreck your day. Then, go to the Levels and Meter menu items to set things right.

Now comes the moment every Eventide user looks forward to: Enter the program area, use the cursor keys — the four arrow keys — to scroll through the programs, then tap the select key. The program loads into one of the DSPs. Use the DSP A/B key to load a program into the other DSP.

Remember that paralleling or following DSPs can create some powerful processing. If you have the unit, then you paid for both, so use them.

There are a number of remarkably creative presets included in the Orville, and many leave the old Max

See ORVILLE, page 50 ▶

The Orville is not a set-and-forget effects box — it means business.

PRODUCT EVALUATION

AKG Condenser Mic Invades Studio

Ty Ford

AKG is taking a shot at the radio broadcast mic market — a domain of industry standards like the Electro-Voice RE20 and RE27ND dynamic mics — with the C 4500B-BC condenser microphone. The models retails for $665.

This unit is not just another mic hitting the marketplace. This is a full-court press. If you buy a 4500B-BC before the end of April, you will get a set of AKG 240M headphones for free.

AKG hopes that this offer, plus a three-year warranty on the mic, indicates that it is not kidding around. The C 4500B-BC also comes standard with its own suspension mount and a foam pop filter.

The neat innards

This model is an end-address, large capsule, transformerless electret condenser mic.

According to the specs, sensitivity is 25 mV/Pa (-32 dBV, (2 dB), frequency response is 20 Hz to 20 kHz, (the graph shows -4 dB at 25 Hz and 15 kHz). Self-noise is an impressively quiet 8 dB-A.

The unit's literature suggests that using 24 VDC and 12 VDC phantom supplies will result in a lower maximum SPL capability and consequently lower dynamic range than with 48 VDC phantom supply. The mic also needs a phantom supply capable of delivering 2 mA. The manual provides several circuit diagrams for building phantom circuits.

The one-inch electret capsule sits atop a small flexible shaft that isolates the capsule from its hemispherical-shaped base. A small rubber O-ring fits around the base and provides some isolation between the capsule and the metallic shell of the mic body.

The base twists bayonet-style into the top half of the body. A metallic resonance was noticeable on the pre-production version I received and sounded like there might have been some direct connection between the shell and the base. I am guessing that the resonance might have been conducted where the slots and tabs of the bayonet connect. However, this problem was absent from production model.

provides a fairly gentle 6 dB/octave low-frequency rolloff that begins at 120 Hz and is down 7 dB by 50 Hz. The other switch inserts a 20 dB pad in the circuit to reduce the sensitivity to that of a dynamic mic.

The AKG C 4500B-BC

While this setup makes "plug-and-play" replacement with most dynamic mics a snap, it also makes the self-noise of the 4500B-BC more apparent. If the self-noise is bothersome, you can switch the pad out and readjust the input to the preamp to compensate for the 20 dB gain.

Get the balance right

In my studio, the 4500B-BC with pad was noticeably noisier than an RE27N/D. I switched the pad out and reduced the input trim on my GML mic preamp. As usual for me, I was running the RE27N/D with the top HF tilt switch engaged. I find

If either mic is turned sideways even a little — and is not receiving signal right down the tube — there is a slight loss in HF.

When attached to the H 100 suspension mount, the mic and mount weigh slightly less than 1.5 pounds; light enough not to overburden some of the smaller spring arm mic supports.

The EV RE27N/D I compared it to weighs a bit more than 1.5 pounds with just the simple, non-suspension mic clip.

The low-frequency (LF) rolloff switch if I do not roll off the top, it can result in an edginess I don't like.

When I removed the pad and readjusted the gainstage on the 4500B-BC, its combined self-noise and preamp noise was quieter than that of the RE27N/D. The frequency responses of the mics are similar, but with slight differences.

Both mics give a thick sound when worked reasonably close to each other. I was able to get right on the grille without overloading the bottom.

The presence peak in the RE27N/D is lower than that of 4500B-BC. You get a bit more "air" up around 6 kHz to 8 kHz with the unit, while the RE27N/D is aggressively focused a few thousand Hertz lower.

The 4500B-BC has a 2 dB dip between 1 kHz and 2 kHz that allows its bottom and top to be more accentuated. The mic also has slightly more upper bass than theRE27N/D, but the difference is so close that minor changes in proximity make the difference negligible. Both mics are equally good at ignoring pops.

If either mic is turned sideways even a little — and is not receiving signal right down the tube — there is a slight loss in HF. The 4500B-BC has a slightly wider pattern than the RE27N/D. The AKG hears well enough from the rear that positioning two on-air talent face to face and closer than two or three feet apart could result in unwanted leakage.

If the rear of the mic is closer than several feet from any hard surface, such as a double glass window or wall, an unwanted sound bouncing into the rear of the mic could occur.

If the studio has many hard reflective surfaces and a high ambient noise level due to computer drives, fan noises or overly loud HVAC duct noises, more of that noise will be heard with an RE27N/D.

If the studio is acoustically well-behaved, the wider pattern and more open top end of the 4500B-BC should result in a more open sound.

The AKG mic is very good at rejecting radiated noise from computer monitors, whereas the RE27N/D started buzzing once it was within a foot of my DAW monitor.

However, not all monitors are created equal and I don't know where mine currently sits on the "spew spectrum." I only know it spews less than the previous one.

As a studio consultant, I never force mics on anyone. Those choices are usually too personal and subjective. The AKG C 4500B-BC appears to be a well-thought-out mic that is obviously targeted for broadcast use.

The mic's relative imperviousness to computer monitor interference makes it a model to consider. When used in quiet studios, I'd suggest running the mic without the 20 dB pad and reducing the input sensitivity of the mic preamp. However, if you have a hot-, slappy-, nasty-sounding room, fixing the mic settings first will make any recording sound better.

Ty Ford can be reached at www.jagunet.com/~tford

Product Capsule: AKG C 4500B-BC

Thumbs Up
- ✓ Unit comes with suspension mount and K240M headphones
- ✓ Three-year guarantee
- ✓ Rejects RF and computer monitor hash

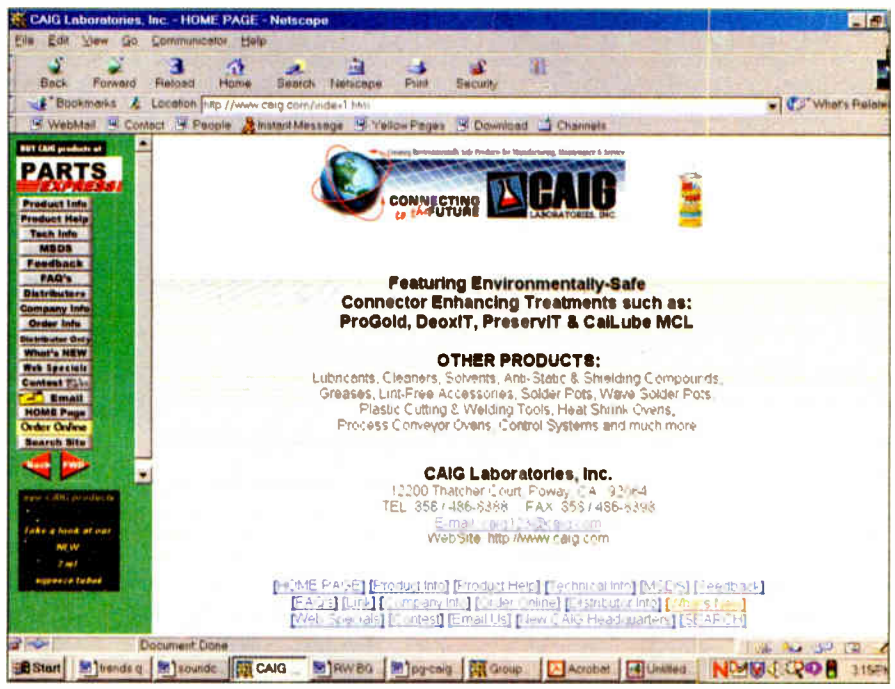
Thumbs Down
- ✓ Picks up more off-axis sound than RE27N/D

For information contact AKG Acoustics in Tennessee at (615) 360-0499, fax (615) 360-0275 or visit the Web site at www.akg-acoustics.com

PRODUCT GUIDE

CAIG Puts Chemicals Online

Customers can now go online to purchase cleaners and maintenance items from CAIG Laboratories. Products including DeoxIT, ProGold, ProGold GxL, CaiLube MCL, CaiKleen, CircuitWriter, CaiShield, CaiKote, R5 Power Booster are available in small or large quantities.



Items can also be ordered through CAIG distributors — listings are found on the Web site.

For more information contact CAIG Laboratories Inc. in California at (800) 224-4123 or visit the Web site at www.caig.com

Orville

▶ Continued from page 48

Headroom stutter effect in the dust.

Among my favorites is "16 mm Projector," which combines the chatter of a classic high school Bell and Howell junker with a vocal filter. The surprise: Hit a soft key and both the projector and the voice slow down in pitch and stop with an *mm-mmrup*.

'Long Distance'

There is "Long Distance," which fills the line with transatlantic noise, return echoes of your own voice and side tone chirps to accompany the echo. It plays like an old Churchill speech and it is brilliant.

"Adaptive Reverb" is a fairly clever reverb. The amount of reverb time dynamically adjusts to the pitch of your voice. Low tones give you long tails, while a high pitch gives you a tiled shower.

There is a solid complement of reverbs, classic reverb emulations such as EMT plates, a marvelous selection of choruses and flanges, vocoding and ring modulating, and a fistful of sci-fi effects to make you grin.

Of course, if you still want the Max Stutter, it's still in there. So is "Doubletalk," known as the Time Scrambler from the earliest Harmonizer units.

The unit has MIDI-controllable oscillators and a bunch of samplers too. Tie a MIDI keyboard to the Orville, set the unit up as a synthesizer, then go ahead and make some noise.

The Orville is remarkably fluent in MIDI and many effects are maximized when used as part of a MIDI rig.

Because the typical radio production room has not ventured far into MIDI territory, any mention here of the Orville's prowess in this sphere would not be pertinent to the tasks of the modern production director. If you are interested in MIDI, however, you may always visit the Eventide Web site for details.

The Orville comes with a playful side as well. Dial up a few work environments complete with related ambient sounds. The traffic report simulation — a favorite from earlier units — drops in a synthetic aircraft whirr and makes the voice sound choppy, while a desktop intercom unit opens with an annoying bleep and a harshly filtered mic effect.

Another classic effect returning is the CB radio simulation, complete with squelched noise burst and distorted mic signal.

I've always joked that a CB simulation was never complete until Eventide invented a chip that gave the voice a characteristic trucker twang. However, given the advances in audio modeling technology, this may not be as far-fetched as once thought.

If you have been used to working with rudimentary "quick set" processors such as the Alesis Nanoverb or Zoom 2001, the panel on the Orville may scare you off. It will be easy to feel helplessly adrift in a sea of parameters, menus and sub-menus, and utility pages difficult to back out of.

The only cure for this is to hoist the manual (all 300 or so pages of it) and get busy. The Orville may well carry the most processing power you have ever encountered in your career and it is up to you to harness that power.

The reward is breaking free of generic "rooms" and "plates" and creating interesting new sounds that will make your production the best in the market.

The Orville is not a set-and-forget effects box — it means business. And for the sake of your station's bottom line, it may bring *plenty* of business.

In the next issue I'll review the ins and outs of programming the Orville to create your own effect patches from scratch.

Alan Peterson splits his time between the Connecticut School of Broadcasting, Radio Free Asia and WAVA(FM) in Washington.

Reach him via e-mail at alan peterson@earthlink.net

Product Capsule:
Eventide Orville Harmonizer Multichannel DSP

Thumbs Up
- ✓ Big and powerful
- ✓ Lots of useful, usable effects
- ✓ Programmability
- ✓ Digital and analog I/O

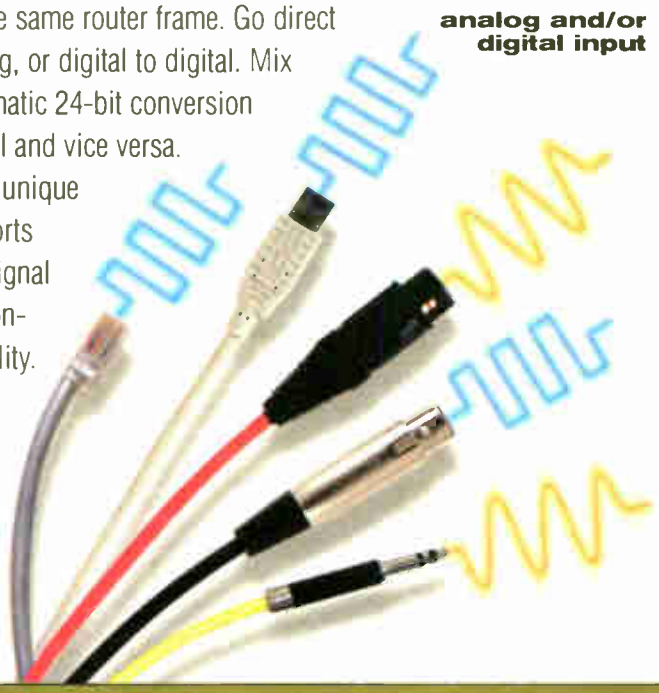
Thumbs Down
- ✓Complex to the point of intimidation for some
- ✓Some programs disabled at high clock rates

For more information contact Eventide in New Jersey at (201) 641-1200; fax (201) 641-1640 or visit the Web site at www.eventide.com

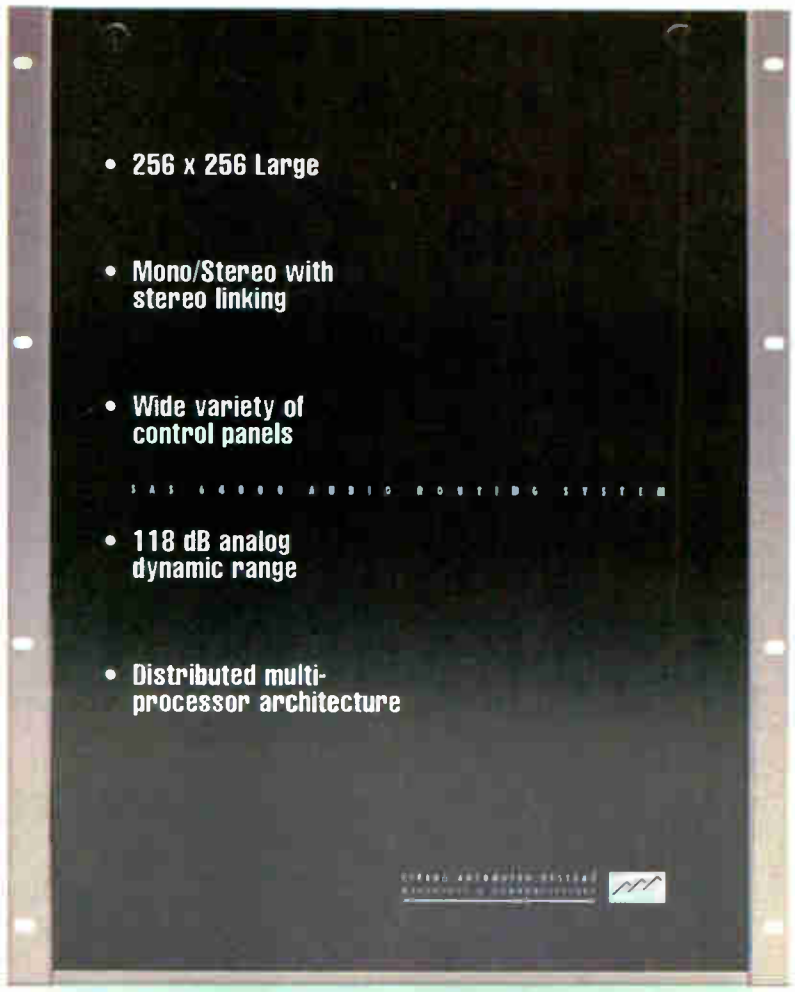
ROUTING SYSTEM

IN If the migration to digital is in your future, then this is the route to take. Introducing the large size, big performance analog router that also speaks fluent digital. A true hybrid that allows you to scale the number of analog and digital ports as needed, now and in the future. Best of all, the SAS64000 Audio Routing System creates a path to AES/EBU digital audio without creating analog obsolescence.

This means you can mix your analog and digital I/O in the same router frame. Go direct analog to analog, or digital to digital. Mix it up with automatic 24-bit conversion analog to digital and vice versa. Either way, this unique architecture sports uninterrupted signal integrity and non-blocking flexibility.

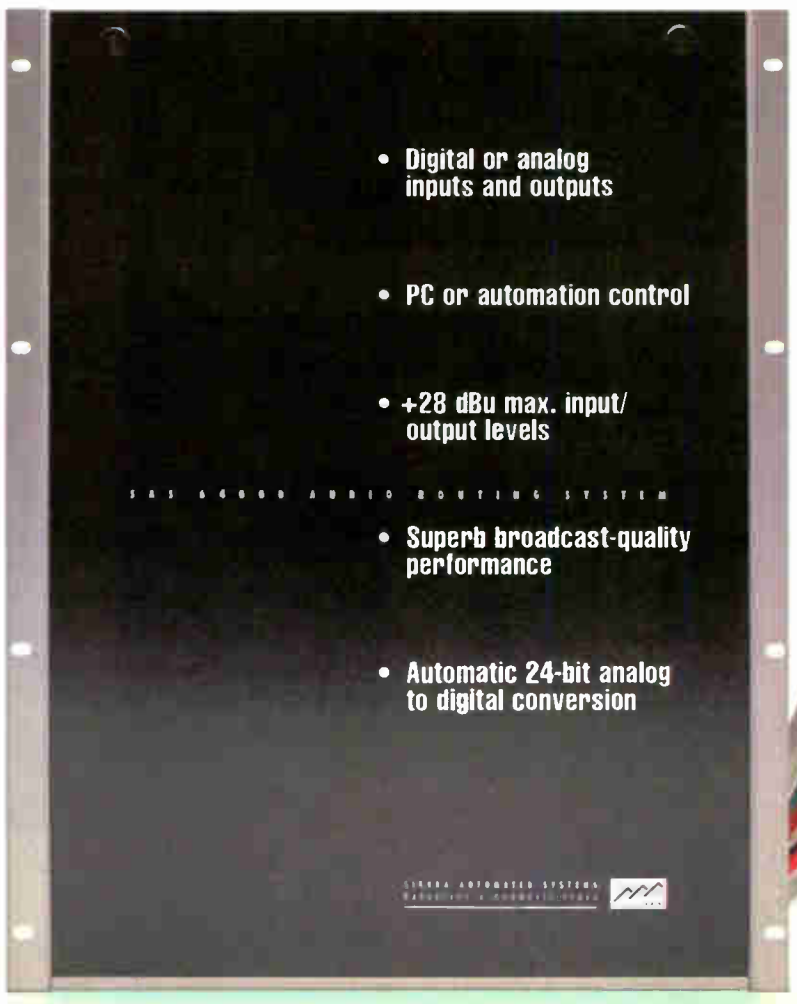


analog and/or digital input



Mix and !

SAS64000 AUDIO



OUT And the SAS64000 is wonderfully simple to integrate, upgrade and put into service. Just plug in our new digital port expander and that's it. Welcome to digital!—co-existing flawlessly with analog—and all in the same framework. Interested? There's lots more to tell. Call **818 840 6749**; or e-mail us at sales@sasaudio.com; or check our website at sasaudio.com. If you're moving into digital, then the SAS64000 Audio Routing System is your conduit to the future.

analog and/or digital output

SAS

SIERRA AUTOMATED SYSTEMS

sasaudio.com

Trends

▶ Continued from page 47

and Windows NT/2000. Windows 98 is the most popular, but Windows ME and Windows 2000 are gaining," said Ellison.

"As Win2000 is the successor to NT, it is a good choice for stability's sake, but again, driver support is more hazardous than for the 16-bit-kernel versions of Windows 95, 98 and ME. For most production purposes, we advise customers to use Windows 98 or Windows ME, because they present the broadest hardware compatibility."

Glassman said that while the company has had specific requests for non-Window or -Mac based systems, he feels that the majority of support is in the Windows category.

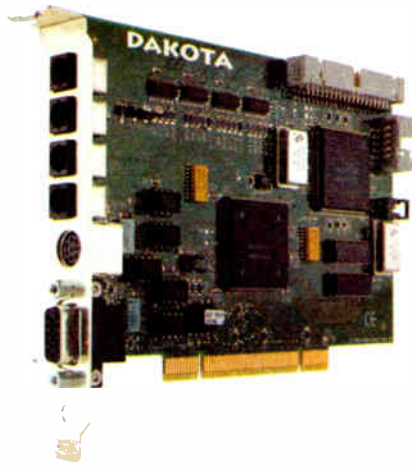
"While we have had some specific development for Unix-based and Linux-based applications, Windows is far and away the leader in radio," he said.

"Microsoft has addressed many reliability concerns in Windows 2000. Unfortunately, Win2K has forced all audio product developers to make compromises when compared to previous versions of Windows."

Even though several manufacturers have encountered problems with the latest Windows operating systems, Hitchcock said his company would continue to focus on broadcasting by developing systems for the most used platforms.

"We see our job as making these dominant operating systems good for broadcast work. We don't seek out less-popular operating systems just because they might make our life easier.

"Windows ME and Windows 2000 are most effective for broadcast applications, since they are so pervasive and since so many non-audio programs exist at great prices," said Hitchcock.



Dakota Soundcard From Frontier Design Group

Tied in with platform support is the history of different manufacturers bundling soundcards and digital audio production software together for certain operating systems. Often this partnership benefits the user through technical service and upgrades for the program allowing the system to stay competitive and avoiding the need to replace an entire system if an upgrade is available.

"The majority of our cards are sold by the software developers," said Glassman. "This tight integration is one of our significant advantages. While the final end-user sees the sound card, the core technology is the development environment which allows our partners to create great applications."

Down the road

Aside from the trend in cost and consumer vs. professional audio cards, manufacturers see other developments on the horizon.

"We're more focused on producing reliable drivers for new operating systems," said Hitchcock. "The PCI soundcard world is fairly mature and stable.

"While we will continue supporting and developing in this area, newer high-speed serial protocols will become more important and more versatile."

Turner sees multiple channels, digital broadcasting and compression algorithms as the three things his company sees in its future.

"Sound cards will continue to offer more simultaneous play and record streams and more complex mixing abilities. Digital AES/EBU inputs and outputs will become a standard requirement as stations move all digital. Cards will need to support both analog and digital so that stations can make a seamless transition," said Turner.

"Also, the standard MPEG-Layer2 compression algorithm will make way for MP3, MPEG-AAC and/or PAC as digital and satellite broadcasting comes of age."

One company supporting Advanced Audio Coding is Digigram. The company plans to develop appropriate soundcards and software to support the algorithm. However, Glassman feels that, while more advancement in audio technology will take place, there is a ceiling to how many stations and studios will need actual soundcards.

"We see our soundcard business reaching a plateau. Only the U.S. has a significant number of facilities that have yet to be based on computer-based audio solutions and the replacement market cannot be as robust as the build-outs of the past decade," he said.

"For this reason, we are concentrated on specific segments of the soundcard market and increasing our efforts with other form-factors," said Glassman.

Ellison sees one of those specific segments of the market as being support of mobile digital audio production.

"Another interesting development is the rise in use of notebook computers as portable recording and production workstations. For these (applications), the many USB cards like the Roland UA-100 are terrific options."

Connected to the factor of portability is the elimination of external devices, such as mixers and recorders.

"Soon everyone will be using all-digital, all-high-quality workstations, whether in on-the-street interviews or in the studio," said Ellison. "For broadcast professionals, cards will tend to obviate the need for external mixers and/or other hardware as the cards and associated break-out boxes offer more features like phantom power, analog gain and output controls, etc.

"Today most sound cards are still static things inside the computer; tomorrow they will do much more to manage the entire flow of audio into and out of the computer, with more features and physical hands-on options available to the user."

What is good for the goose?

What to choose — quality consumer cards, or sound cards that are designed specifically for broadcasting? Either way, stations and studios have affordable options.

"It is difficult to judge fairly on anyone's sound card choices but we think soundcards are often judged on the basis of price and fancy-sounding concepts more than on basic abilities," said Ellison. "Broadcast radio producers should focus on stability and necessary features in choosing a soundcard."

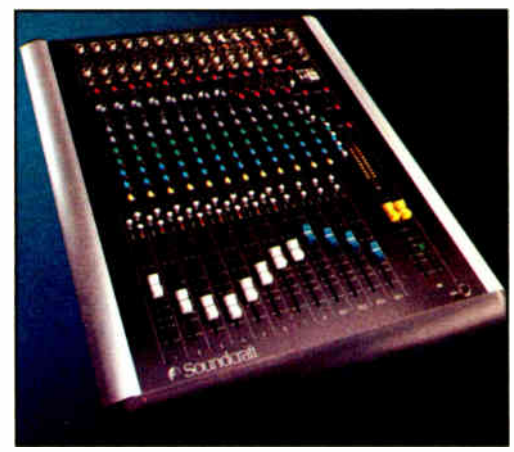
PRODUCT GUIDE

Soundcraft Releases Compact Mixers

Spirit M Series compact mixers are the latest offering from Soundcraft.

The Spirit M4, M8 and M12 offer four, eight and 12 mono inputs respectively. All feature four stereo inputs, four stereo returns, 100 mm faders and an S/PDIF stereo digital output. All channels have peak and signal LEDs, complemented by a stereo output meter.

The mono input mic preamp design is from the Soundcraft Ghost console. The three-band EQ has a swept mid and focused HF response.



The mixers feature a steel chassis that can withstand 130-pound loads. The Spirit M8 and M12 also have rackmount capability and conversion involving the removal of the side trims and a few screws.

Additional features of the series include four auxiliary sends: two pre-fade, two post-fade; pre- and post-fade switchable direct output on every mono input channel; an insert point on each channel for external signal processing; 48 V phantom power; 100 Hz high-pass filter; PFL on each channel for signal monitoring pre-fader and AFL monitoring of each aux output and two-track playback inputs with level control, PFL and mix replacement function.

The suggested retail price for the Spirit M4 is $699; Spirit M8, $849 and Spirit M12, $999.

For more information contact Soundcraft USA in Tennessee at (615) 360-0471, fax (615) 360-0273 or visit the Web site at www.soundcraft.com/usa/usa.html

DIGITAL DOMAIN

External or Internal Processing?

Sound Cards Are Now Achieving So Much From So Little. Is External Analog/Digital Conversion Needed?

Mel Lambert

For a long time now, I have been cynical about the ability of plug-in audio sampling and processing cards to achieve the same sort of high-quality sonic performance as external systems.

After all, the inside of a typical Windows PC or Apple Macintosh is a rather hostile environment. In addition to the familiar AC-derived sources of hum and interference, there are plenty of high-frequency oscillators and timing circuits radiating healthy square waves well into the Gigahertz range.

Restricting that type of RF hash from interference with DSP circuits is one thing. Making sure that it does not upset critical A/D and D/A conversion stages is quite another matter. Or at least that was what I thought.

Run interference

Early sound cards supplied with more modest-priced PCs were indeed marginal in audio performance. This led to the conclusion that the converters themselves primarily were to blame for odd-sounding audio.

High-frequency performance in particular was less than thrilling, with unusual artifacts being produced from signals close to the Nyquist frequency.

What sparked an internal dialogue so compelling that it resulted in such a sharp left turn?

This questionable quality almost certainly was due to poor filter design, with plenty of noxious-sounding aliaising artifacts. It was also caused by poor DC decoupling and other quirks resulting from "cost-effective" circuit design.

So whenever prompted for an opinion, I was more inclined to suggest that the critical analog and digital conversions be performed *outside* the host computer. This route might have lead to better performance, but certainly affected the bottom line.

It may be all too obvious, but external converters in general cost significantly more than those built directly onto sound cards. There are several reasons for this difference, some not immediately apparent.

The obvious difference is that there are additional parts costs involved, such as an elegant case, controls and power supply unit. This means extra end-user dollars. Less obvious are the perceptions that were cultivated by manufacturers of such devices.

The makers had a vested interest in supporting the belief that conversion needed to be performed in a dedicated system and the digitized signals then fed to the computer. We ended up with a situation that could be attributed more to marketing strategies than technical considerations.

In recent years, however, I have been surprised at how one's preconceptions can cloud the objective process. For too long, I was more inclined to favor the external conversion approach over the on-board solution. But recent events have caused me to reflect and eventually reject what I would agree was a prejudiced viewpoint.

Conversion apparent

What sparked an internal dialogue so compelling that it resulted in such a sharp left turn?

Simply, I needed to develop a stand-alone multi-channel editing system for a client and decided to perform some listening tests. The budget was reasonably modest; there was enough money for a good-quality conversion system but not, I soon determined, sufficient for external converters.

Assembling a pile of data sheets, I started to check out published parameters in order to develop a short list of six systems that I would evaluate. Impressed with some of the noise specs, I looked forward to auditioning representatives of these latest-generation offerings.

What I found was revealing.

Naturally, there were functional differences. Some cards offered high- as well as low-level inputs, the familiar +4/-10 dBV options. The systems were all capable of converting line-level analog sources to 16- or 24-bit words at sampling rates between 32 and 48 kHz.

I still consider 96 kHz as being primarily applicable to high-resolution music mastering applications; anything

See DIGITAL, page 56 ▶

Comrex

▶ Continued from page 47

7 kHz bi-directional audio at speeds as low as 14.4 kbps, with a 300 bps data channel that might be appropriate for text messages.

Additionally, the Matrix will back up an STL. Should your studio link take a powder at the wrong time, go to the hidden menu and configure your studio end. It will dial a number at the transmitter site, where you have conveniently connected your similarly configured portable Matrix.

Wireless applications

Analog and first-generation digital cell phones do not support the Matrix technology yet. The reason is the systems cannot support the steady data rate needed for a codec to work and send quality audio.

The GSM technology is the best available, but still won't equal that of a dialed-up POTS line. When the GSM module is released, the Matrix will pass audio at about a 5 kHz audio response rate. This rate may be acceptable for quick voice applications like drop-ins and news wraps, but not full-fledged remotes.

Tom Hartnett, vice president of engineering, and his crew get a gold star for trying to accomplish this, which is much like trying to stuff 10 pounds of sugar in a five-pound bag. Tom's pamphlet "Wireless PCS Remotes: How and When" was so clear that even a non-technical person could understand why remotes can or can't happen.

Comrex has always been noted for its straightforward operations manuals; this is as good a manual as I have seen for any piece of equipment.

Both the portable and studio versions cost $3,700. The battery kit is $450. The ISDN and GSM cell modules will sell for $850 and $500, respectively.

If there is such a thing as a serious one-size-fits-all remote solution, it is the Matrix. The unit can pay for itself simply because it has ability to back up an STL.

In addition, after three or four months of live client remotes several times per week at $800 a pop, the cost easily will be recouped.

Paul Kaminski is the news director for the Motor Sports Radio Network. Contact him via e-mail at motorsportsradio@compuserve.com

Product Capsule:
Comrex Matrix Codec System

Thumbs Up
- ✓ Versatile, solving remote problems with POTS and ISDN
- ✓ Backward-compatible with Vector and HotLine
- ✓ Store and Forward timeshifts audio file delivery
- ✓ Straightforward manual
- ✓ Easy and reliable mixing functions

Thumbs Down
- ✓ Store and Forward audio more suited for voice recordings
- ✓ ISDN and GSM modules not available yet

For more information contact Comrex Corp. in Massachusetts at (978) 263-1800; fax (978) 635-0401 or visit the Web site at www.comrex.com

Matrix Safely Tucked Away

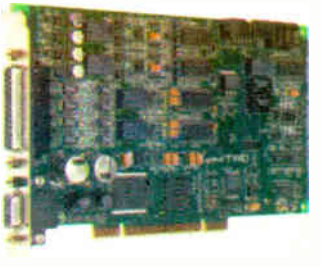
Matrix can hook up to a cell phone.

PRODUCT GUIDE

Lynx Studio Lets The Second Cat Out

The LynxTwo from Lynx Studio Technology Inc. is a half-size PCI audio card compatible with a Windows- or Macintosh-based audio or video workstation.

The unit will be available with three analog I/O configurations: the four I/O "A" model; the two-input/six-output "B" model and the six-input/two-output "C" model. Analog I/Os are balanced and offer +4 dBu or -10 dBV line levels, which are selectable in channel pairs through software.



The digital I/O capabilities of the LynxTwo include one I/O port that supports both AES/EBU and S/PDIF formats at 16-, 20- and 24-bit depths. The transformer-coupled ports are provided on XLR connections and operate at sample rates up to 96 kHz. A sample rate converter provides up to 3:1 rate conversion on digital input signals.

To accommodate audio channel expansion and a variety of interface standards, LynxTwo incorporates two LStream ports that are capable of transferring eight I/O channels of 24-bit/96 kHz audio data. The internal port allows data routing and synchronization between multiple LynxTwos.

The external port provides a connection point for various LStream interface modules. Lynx will initially offer ADAT and TDIF modules, with the former providing S/PDIF optical (TOSLINK) I/O.

The unit is adept at slaving to all standard reference clocks. The extremely low-jitter sample clock generator will lock to WORD clocks as well as NTSC or PAL composite video signals.

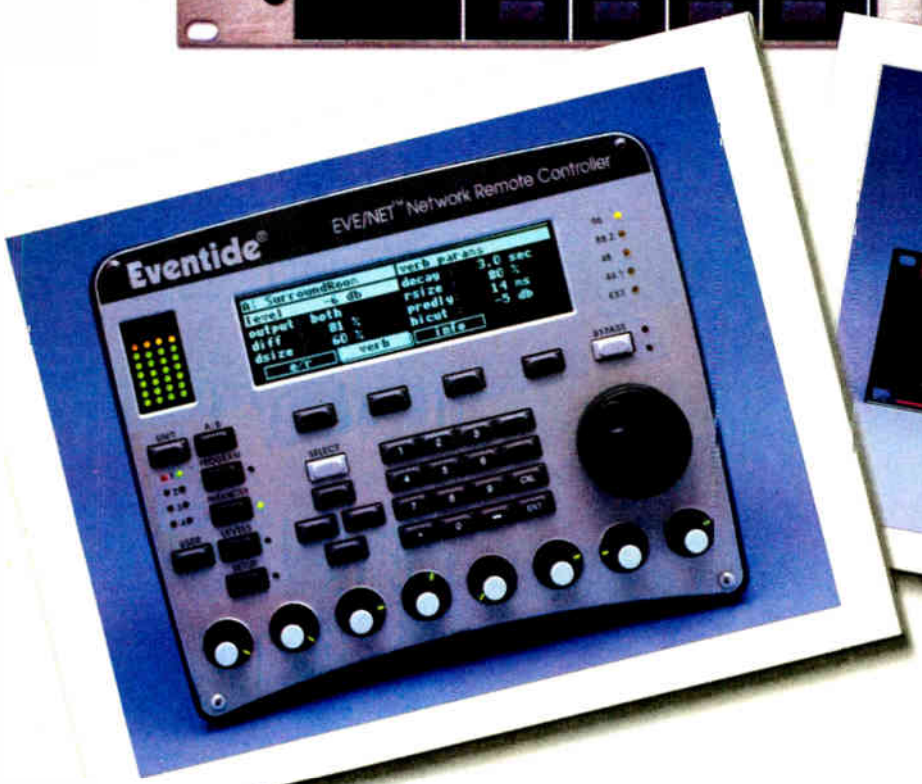
The LynxTwo ships with drivers for Windows 98/ME/NT/2000 and Macintosh. The mixer application is included and allows software control of volume, muting, monitoring, digital format, analog trim and sample clock settings.

The unit ships with six-foot shielded cables for analog and digital audio connections and two-foot cables for external sync I/O.

The entire package has a suggested list price of $1,095.

For more information contact Lynx Studio Technology Inc. in California at (949) 515-8265, fax (949) 645-8470 or visit the Web site at www.lynxstudio.com

Now Orville Has A Family



Introducing Eve/Net -

The Eve/Net™ Network Remote Control System provides flexible, total remote control for the Orville™ Harmonizer® processor family - without the overcomplications and high costs of other multi-channel effects processor controllers. And perhaps best of all, there's no steep learning curve. The Eve/Net system links one or more Eve/Net remote controllers with multiple Orville or DSP7000/7500 processors in any combination.

Introducing Orville/R -

Face it. If there's an Eve/Net remote sitting conveniently on your console, or if perhaps you've installed multiple Orville processors in a central machine room, you may never use the Orville's own front panel controls. So why pay for them? Eventide's new "no faceplate controls" Orville/R model has all the capabilities of the standard Orville, but is designed for use exclusively with Eve/Net. You can mix and match standard Orville and Orville/R processors. You could pay many $1000s more for a competitor's multi-channel processor system and still not equal the versatility, quality and ease-of-use of Eventide's Orville system.

Introducing the DSP7000 -

Eventide hasn't forgotten that when it comes to music, it's still very much a stereo world. We're proud to introduce the DSP7000 Ultra-Harmonizer® Stereo Effects Processor. The DSP7000 is a major upgrade of Eventide's legendary DSP4000-series, featuring up to four times the processing power for higher effects density and superior audio performance. 24-bit conversion at 96kHz of course. It features hundreds of exciting preset programs including your favorites from the DSP4000 line, and it's even easier to use than the DSP4000.

Introducing the DSP7500 -

A long-standing Eventide tradition is our "500" model series. The "500" models offer all the standard Ultra-Harmonizer processor features and then some, and are priced to be exceptional values. The new DSP7500 Stereo Ultra-Harmonizer® Effects Processor upholds that tradition beautifully. It's a DSP7000 to-the-max, featuring hundreds of additional presets especially useful in post-production and broadcast applications, plus a 174 second (mono) / 87 second (stereo) sampler with special preset programs which make it one of the most versatile samplers you've ever used. You'll never run out of ways to use the extra capabilities of the DSP7500 processor.

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PRODUCT GUIDE

Mackie and Emagic Form Partnership

Mackie Designs Inc. and Emagic have teamed up to develop a series of hardware controllers.

The companies' first project will be "Logic Control," a control surface for Emagic Logic Audio software. It will be designed and developed as a modular system.

"When we were looking for a controller solution for Logic Audio we concluded that it would be ideal for Emagic to team up with a company experienced in building high-quality studio hardware at very competitive cost. With Mackie we have found the perfect fit," said Sven Junge, president and CEO of Emagic.

"Our goal is to build a very powerful, yet affordable, hardware controller for one of the most widely used audio production applications available today," said Jamie Engen, CEO of Mackie.

For more information contact Mackie Designs Inc. in Washington at (800) 898-3211, fax (425) 487-4337 or visit the Web site at www.mackie.com

Sven Junge, Left, President and CEO of Emagic and Greg Mackie, Owner of Mackie Designs

Digital

▶ Continued from page 53

below 32 kHz falls into the realms of data compression or specialist multimedia applications. However, the A/B comparisons between high-quality sources and the results of back-to-back conversions — on-board A/D followed by immediate D/A with no disk access — were surprising.

There were minor subjective differences between source and processed signals, but nothing that was noticeable nor that would cause problems on-air or for tasks that formed part of a multi-track production.

Mid-frequency performance in particular was outstanding on all the samples, aside from signals that were close to the clip point. If I were prompted to assign a single test parameter that separates outstanding converters from "okay" designs, it would be how the test handles transients.

Obviously good analog input, buffer and output stages are required. But high-speed DSP sections are essential to ensure that rapidly changing signal profiles can be tracked accurately and reproduced faithfully.

Solid ground

While on the subject, I found more significant subjective differences when I experimented with grounding schemes — using audio cables, for example, to carry ground back to a workstation, rather than between PCI-based cards.

Nasty stereo imaging problems can result from forgetting to supply stable word-clock signals from attached digital systems. In addition, odd-sounding high-frequency results with long, sustained piano and string notes can be a problem.

Good engineering practice can contribute more to sweet-sounding recordings than differences between major brands.

So, for me, the bottom line was simple: Choose a brand that offered good after-sales support, plus online software and firmware updates; and expect to pay a modest amount for a good-quality digital I/O card, plus bare-bones creative software.

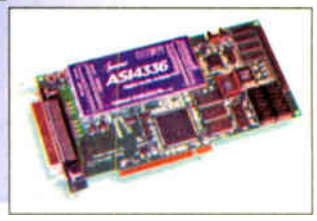
All these devices obviously were capable of getting signals into and out of the digital domain, but usually only ship with basic versions of popular editing software bundles. Leave it to the dedicated manufacturers to market sample-accurate editors with all the DSP bells and whistles.

The same basic criteria apply to PCMCIA-style cards for laptops and some PC systems.

I would be the first to admit that advances in circuit topology have allowed a remarkable amount of high-quality surface-mount components to be crammed onto a remarkably small amount of DSP real estate.

While these systems — for manufacturing reasons as well as smaller market potential — mean that basic costs are higher, there is no reason to expect less-than-stellar sonic performances from cards being offered by the leading contenders.

Writer Mel Lambert founded Media&Marketing to provide communications and consulting services for pro audio firms and facilities. Reach him via www.mel-lambert.com



NEWS ANALYSIS

Digital Audio Finds Common Voice

Bernard M. Cox

The analog production construct that many people use as a point of reference served audio production well for many years. Analog audio presents no severe issue of compatibility; operations were standardized.

The ability to manipulate digital audio brings powerful capabilities to the radio production person. It also presents challenges. Each time a new compression or file format arrives on the market, a new standard is created. The capabilities of digital audio production equipment are advancing constantly.

As a result, manufacturers and engineers are tackling compatibility issues as they see a move to a more networked and mobile environment.

What's ahead? RW talked to several industry suppliers.

Whatcha doin'

Currently, Digigram is promoting networking and a new audio codec.

"Networking of workstations within sites and throughout a company's properties continues to be a significant demand," said Neil Glassman, president of Digigram.

"Part of this is integration with other computer-based systems in the facilities, such as automation/live-assist systems. No one wants to walk a tape from room to room or use overnight couriers when network technologies and bandwidth can now address most requirements."

In addition, he feels that mobility is tied in with the networking capabilities of a modern radio station and plans to support that idea with the PCXpocket 440 audio card as a companion to the Xtrack Audio Suite mixing and editing system.

Robert Ellison, president of Syntrillium Software, agrees with Glassman. "Obviously, online distribution and increased automation are big trends in both radio and mainstream audio," he said.

Price and performance

And at Dalet Digital Media Systems, Eric Richardson commented that price and performance shouldn't be mutually exclusive.

"Clearly the migration towards host-based audio processing and plug-ins is the most exciting trend," said Richardson, product engineer for Dalet. "Specialized sound cards for MPEG compression or audio DSP are quickly becoming 'virtual,' giving our customers a much better price/performance for the average production workstation."

One apparent trend is partnerships or consolidations of companies in the hopes of creating more audio data standards.

This issue of *Buyer's Guide* includes an item about Digigram, AT&T, Dolby Labs, Fraunhofer Institute for Integrated Circuits and Sony Corporation partnering to develop MPEG Advanced Audio Coding, or AAC.

"We see AAC as an important direction for radio stations," said Glassman.

According to *www.aac-audio.org*, AAC is standardized as part of the MPEG-2 specification.

"MP3 (MPEG-1 Layer 3) is pretty darn good, but AAC offers more efficient use of bandwidth. In addition, MP3 does not have any 'rights management' component," said Glassman. "AAC does, allowing content providers the ability to prevent piracy, track usage, etc. Rights management is important in both consumer and commercial applications."

The SADiE Radia Workstation is an example of how manufacturers are positioning their digital production products as affordable yet capable.

For traditional broadcasters, he said, AAC can provide an alternative for remote broadcasts and STL applications that currently use MPEG Audio Layers 2 and/or 3.

"For new broadcasting models, AAC can provide higher quality, more efficient use of bandwidth, easy-to-implement multichannel delivery — for surround sound transmissions — and rights management to protect return on investment."

As more producers have the ability to manipulate and delivering digital content through networking and the Internet, stable software audio codecs have become more important to radio stations and production studios.

"In the past, you set your studio for zero gain and maybe had some unbalanced-to-balanced audio converters. But with networked digital audio, you have more complex layers to address," said Glassman.

Developments such as AAC and other standards typically require interested parties to pool resources and try to create a standard format.

Automation and workstation companies have taken note.

"SADiE is continuing to work with other manufacturers and trade organizations to ensure standardized interchange formats," said Jeff Giedt, vice president of sales and support at SADiE.

"SADiE was the first to release the new AES31-3 interchange format that allows edited digital audio to be moved between different DAWs and digital recorders. We also continue to promote Cart Chunk file as a standard for radio production and automation systems."

According to the Audio Engineering Society, AES31-3 addresses the interchanging of sample-accurate edit information among different platforms and is

See DIGITAL, page 58 ▶

Digital

▶ Continued from page 57

applicable to a wide range of interchange scenarios, including network audio-file transfers and physical interchange in various forms

Several other companies, such as Digital Audio Research (DAR) and Euphonix, are implementing and supporting this new format. The DAR editing systems now include Genesis software. This software gives systems the ability to operate with a wide cross-section of third-party devices and software and includes file support of WAV, OMFi, AES31, ProTools and Lightworks systems.

Ellison pointed at a problem which standardized codecs and file-sharing formats are aimed at solving. He said bandwidth remains a key obstacle to digital audio in general.

"We have the production systems and storage systems available, but still lack the bandwidth to easily distribute large amounts of audio easily and cheaply," said Ellison. "As more and faster Internet access systems become available, this obstacle should go away, but that solution has been a long time coming."

Fit in the digital world

Ellison said another hurdle in digital production is creating intuitive products and training people to use these systems.

"Digital audio production is still a very young niche," said Ellison, "and still aimed too much at professional use by people familiar with analog audio paradigms.

Digigram's PCXpocket 440 Audio Card

"Most people aren't born with an innate understanding of audio, but the production systems available seem to assume we all have that," he said. "The next generation of producers will be raised on DAW use and they will expect the kind of random access, instant response and crystal clarity of the digital system."

Richardson agreed, "The biggest obstacle is psychological and organizational. Broadcasters and news organizations still rely on analog technologies and workflows. The transition to digital represents a huge investment in training and rethinking how people should work together."

So what does this all add up to? Companies see that consumers want affordable, reliable products that are easy to use, and they say they are prepared to provide such systems. In order to provide the best systems at the right price, manufacturers are implementing standardization practices that will ensure support and communication between devices.

These developments, in the form of downloadable software patches or upgrades to current systems, may stave off obsolescence.

No one likes to be left behind.

What do you think is the most important next trend in digital audio production? Write to us via e-mail at radioworld@imaspub.com

TECH UPDATE

QSC Switches On the RAVE-s

QSC RAVE-s (Routing Audio Via Ethernet) signal transport systems support operation on switched networks. This feature allows audio and computer data to be transmitted over the same Ethernet network.

RAVE-linked audio systems can accommodate hundreds of audio channels over a single CAT-5 or fiber optic cable.

The system supports 100BaseTX/FX repeater networks, which can transmit up to 64 channels of uncompressed 48 kHz digital audio on Fast Ethernet networks. The devices distribute audio up to 1.25 miles with multi-mode fiber optic cable and up to 328 feet with CAT-5 UTP cable.

The RAVE line includes six models with analog and digital I/Os.

For more information contact QSC Audio in California at (800) 854-4079, fax (714) 754-6174 or visit the Web site at www.qscaudio.com

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TECH UPDATES

Dalet Adds to Cross Content System

The Dalet digital newsroom system features a new video editor and integration with the Virage Videologger.

With the digital newsroom system, users can produce content in a single environment using a set of integrated text, audio and visual content editing tools. The product can then be scheduled and delivered — streamed or published — over multiple media including the Internet, wireless devices, interactive TV and radio.

The system is designed to allow content providers to maintain editorial consistency across multiple media, simplify production, expedite workflow and adapt to future media outlets.

For more information contact Dalet in New York at (212) 825-3322, fax (212) 825-0182 or visit the Web site at www.dalet.com

Alesis Ineko Goes for Effects

The Alesis Ineko is a compact, desktop stereo effects processor.

Designed for music recording, DJ applications and live production use, the unit allows the user control over real-time effects through a user interface. The faceplate has a 6 x 8 LED grid/program display, which shows the 48 reverbs, delays, filters and parameters.

Three dedicated knobs control effects parameters. The large knobs provide real-time control over various functions. A bypass button gives users the ability to engage or disengage signal effects during use.

While Ineko offers reverb and delay programs, it has many other effects, from sub-harmonic synthesizer, fuzz, "vibrowobbel" and formant filter, to frequency-shifter, band-limiter, decimator, vocoder and more traditional effects such as chorus, vibrato, flanger and phasers. Effects are grouped by category.

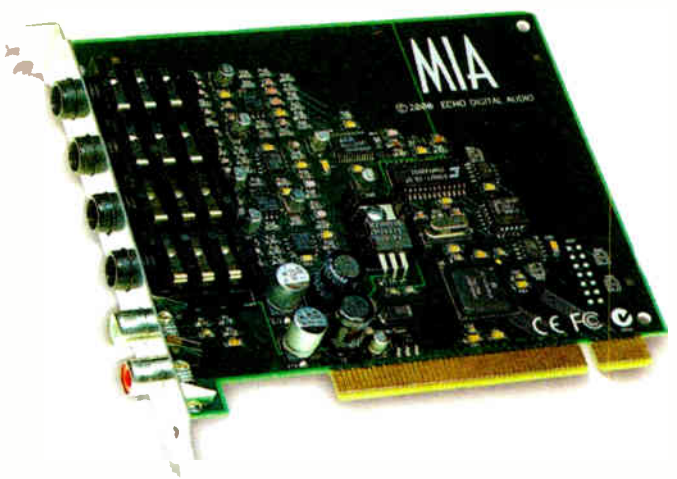
The unit also features 24-bit converters, 1/4-inch stereo inputs and outputs, trim control and comes equipped with an Alesis P-3 power supply. The Ineko lists at $199.

For more information contact Alesis in California at (800) 525-3747 or visit the Web site at www.alesis.com

Mia Benefits From Virtual Outputs

The Mia sound card from Echo Digital Audio offers a pair of balanced analog inputs and outputs and operates at the +4 dBu levels used by pro audio gear. The unit combines these features with 24-bit/96-kHz converters and 106 dB of dynamic range.

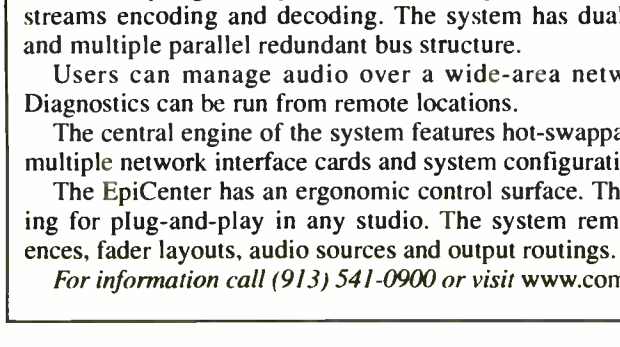
Also included in the list of features is a S/PDIF digital audio interface for connecting to other digital audio equipment. The Mia also uses "virtual" outputs. The unit appears to the software as if it has eight separate outputs, which are then digitally mixed down to the physical outputs using the "console" software and its onboard DSP.



The model is compatible with popular multi-track software and is packaged with Syntrillium's Cool Edit Pro SE. The Echo "multi-client" drivers allow more than one application — such as an editor and software synth — to be played through Mia at the same time.

The system is compatible with Windows 95/98/ME/GSIF and drivers will be available for Windows 2000/WDM/NT/Be and Mac soon.

For more information contact Echo Digital Audio in California at (805) 684-4593, fax (805) 684-6628 or visit the Web site at www.echoaudio.com



Sound Forge Ups the Ante to 5.0

Sound Forge 5.0 is the latest edition of the Sonic Foundry audio editing program. This version includes 20 DirectX Audio Plug-Ins, such as XFX1, XFX2, XFX3 and Acoustic Mirror, which can be used for acoustic simulation and microphone modeling.

The suite of audio effects includes amplitude modulation, chorus, delay/echo, distortion, dynamics, compression, enveloping, flange/Wah-Wah, gapper/snipper, noise gate, pitch bend/shift, reverb and Vibrato.

The system has three EQs — graphic, parametric and paragraphic. It includes time compression/expand and supports DirectX-compatible plug-ins from third-party applications.

Additionally, Sound Forge 5.0 provides support for 24-bit/192-kHz audio files, track-at-once CD burning and CD ripping. These features allow the user to produce audio CDs and to transfer music to a hard drive with saving options in MP3, WAV and WMA formats.

Sound Forge provides approximately 200 audio effects, presets and processes.

Sound Forge 5.0 is available in full beta format for download at the Web site *www.sonicfoudry.com* and is expected to ship this month.

For information call (800) 577-6642 or visit www.sonicfoundry.com

Computer Concepts Focuses on Center

EpiCenter from Computer Concepts Corp. is an audio management system. The network can route, process, EQ and reroute station audio sources — analog and digital — in real time. In addition, the system can record, encode, decode, store and play hundreds of audio events simultaneously.

Other features of EpiCenter include scalable DSP processing, programmable audio delays, gain adjustments, EQ adjustments and multiple MPEG audio streams encoding and decoding. The system has dual redundant power supplies and multiple parallel redundant bus structure.

Users can manage audio over a wide-area network (WAN) in real time. Diagnostics can be run from remote locations.

The central engine of the system features hot-swappable system and audio cards, multiple network interface cards and system configuration stored in EEPROM.

The EpiCenter has an ergonomic control surface. The surface is portable, allowing for plug-and-play in any studio. The system remembers individuals' preferences, fader layouts, audio sources and output routings.

For information call (913) 541-0900 or visit www.computerconceptscorp.com

Otari and Yamaha Develop mLAN Chip

Otari Inc. and Yamaha Corp. have announced a partnership to employ the Yamaha mLAN digital network interface technology.

MLAN is a digital network interface technology based on the IEEE1394 protocol that allows professional audio/video equipment, PCs and other devices to be interconnected using a single cable.

Otari and Yamaha aim to develop a chip capable of handling four times the number of audio channels. However, the development will not include the IEEE1394 link layer.

The new chips, called mLAN-PH2, will have 32 channels of digital audio input, 24-bit at 48 kHz, and 32 channels of digital audio output. Simultaneous input and output of 128 digital audio channels will be possible because up to four of the chips will be connectable to a single link layer chip in a cascade. The chips will permit the transfer of data at up to 400 Mbps. This transfer speed is an increase of the maximum data transfer rate of mLAN-PH1 chips, which is currently 200 Mbps.

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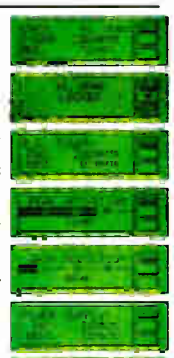

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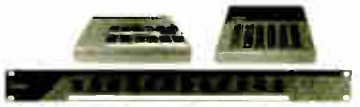

BOS, ROS & PBB-24 Switch Panels
The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but in a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII character strings.

SRC-8 Serial Remote Control
The SRC-8 provides a means of adding 8 channels of remote control to RF, wireline and fiber type STL systems and may also be used with dedicated modems (full & half duplex models).

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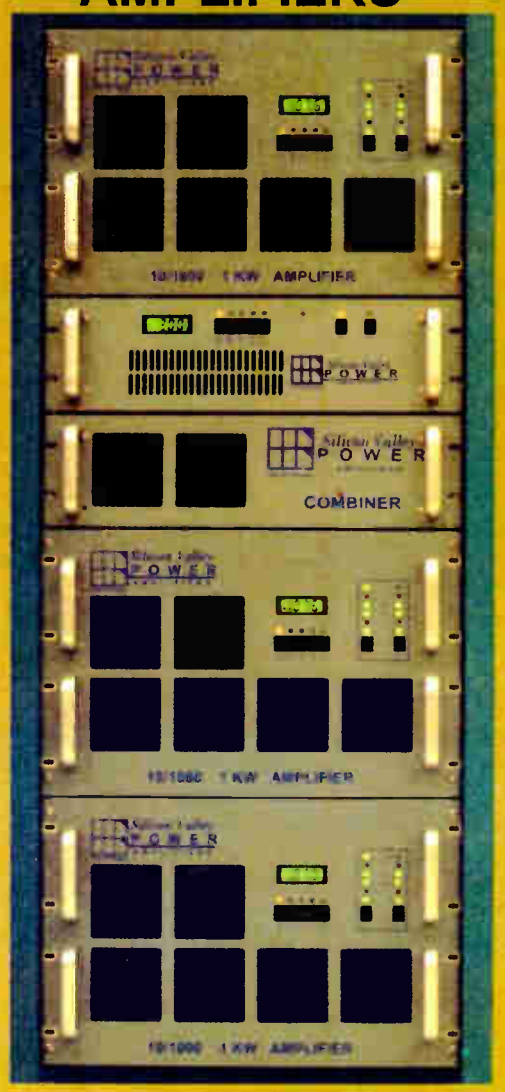

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TECH UPDATES

BSI Aims to Equip Radio Studios

Broadcast Software International (BSI) launched Studio Kits, a line of combinations of software and hardware customized for small-, medium- and large-market broadcasters.

The Studio Kits come in three configurations. The $4,799 Studio Kit 100 is geared toward smaller markets and single stations. The Studio Kit 200 is designed to provide versatility in mid-sized market use and costs $6,599. The Studio Kit 300, priced at $9,999, is aimed at major markets and enterprise broadcast facilities.

Each Studio Kit contains all of the hardware and software needed to equip a production and air studio. Among the products included in the Studio Kits are the BSI WaveStation digital automation system, Cool Edit Pro from Syntrillium Software and audio adaptors from AudioScience.

Each Studio Kit also comes with one year of technical support and software upgrades. *For more information contact BSI in Oregon at (541) 338-8588, fax (541) 338-8656 or visit the Web site at* www.bsiusa.com

Digidesign Releases Edit Pack

The Digidesign Edit Pack is an add-on option for the ProControl mixing control surface. Edit Pack has two touch-sensitive motorized joysticks for surround-sound panning, a QWERTY keyboard and trackball, eight-channel high-resolution metering and dedicated editing switches allowing "single-button" access to common software features within Pro Tools. The package is the same size as standard ProControl Fader Pack, allowing for integration with existing systems.

The system's two motorized, touch-sensitive joystick panners use DigiFader technology for surround panning control. Dedicated panner section switches offer access to channel mute, solo, joystick assignment, X/Y divergence and more.

LED displays include automation status for panner automation and eight, 40-segment, dual-chroma meters for metering of Pro Tools output channel groups.

A laptop size QWERTY keyboard is included for data entry and "Command Keys Focus" editing control, as is a large, dedicated Track Ball for navigating within Pro Tools sessions.

For information call (650) 842-7900, fax (650) 856-4275 or visit the Web site at www.digidesign.com

SADiE Adds AES31 Standard to Line

SADiE products will now incorporate the AES31 file transfer protocol for network and file transfer of digital audio.

AES31 defines the source material alongside edited audio, including cross fades, which are text-based in the manner of a traditional EDL. This process facilitates readable and correctable files if circumstances require alterations.

The format is sample-accurate and supports multichannel files in excess of 99 channels, as well as interchange between PAL and NTSC formats.

The format, which has been ratified as an international standard, is open and non-proprietary and not exclusive to any single manufacturer.

For more information contact SADiE (Studio Audio Digital Equipment Inc.) in Tennessee at (615) 327-1140, fax (615) 327-1699 or visit the Web at www.SADiEUS.com

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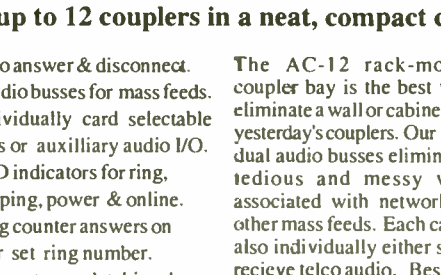

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TECH UPDATES

AudioScience Adapts To Broadcast

The ASI4336 PCI broadcast audio adapter from AudioScience features multi-stream MPEG audio record/playback, GPIO and an RS422 serial input.

The GPIO consists of eight relay outputs and 16 opto-isolated inputs. These connections enable the control of station equipment and sensing of news feeds and other events. Through the use of the WaveX extensions to its Windows multimedia drivers, the GPIO may be accessed using standard Windows mixer calls.

The RS422 serial input supports the direct input of a satellite receiver MPEG bit stream, which can be recorded as a standard WAV or BWF file for later playback. The ASI4336 removes the MPEG transcode and analog-to-digital conversion process that occurs when recording network satellite feeds.

Three balanced stereo inputs and four MPEG-1 Layer II playback streams can be digitally mixed to four balanced stereo outputs. One stereo MPEG-1 Layer II record stream can be sourced from any of the three inputs.

The unit features 20-bit over-sampling. A/D and D/A converters provide greater than 90 dB of signal-to-noise ratio and less than 0.005 percent of THD+N when recording or playing.

The ASI4336 lists for $2,395. Drivers for Windows 98, Windows NT and Linux are available on the company Web site.

For more information contact AudioScience Inc. in Delaware at (302) 324-5333, email sales@audioscience.com *or visit the Web site at* www.audioscience.com

Digigram Acquires New Codec

Digigram has licensed MPEG Advanced Audio Coding (AAC) and will integrate the codec into its suite of professional audio tools.

AAC is standardized as part of the MPEG-2 specification and is a product of the efforts of several organizations including AT&T, Dolby Laboratories, Fraunhofer Institute for Integrated Circuits and Sony Corp.

Dolby Laboratories handles the administration of licensing the ACC codec. The codec is an audio coding technology used in broadcast and electronic music-distribution applications.

AAC is compatible with digital rights management, encryption and watermarking solutions currently available. The codec provides up to 48 channels of audio and sample rates of up to 96 kHz. It can achieve ITU-R broadcast quality at 320 kbps for a 5.1-channel audio program.

Additionally, Digigram has signed an agreement to license AT&T Labs implementation of the MPEG-2 AAC software. Digigram plans to deploy the software in its multichannel professional audio codecs.

For more information contact Digigram in Virginia at (703) 875-9100, fax (703) 875-9161 or visit the Web site at www.digigram.com

Enco Offers an Editing Intern

The Digital Intern from Enco Systems is a software-only-based two-track editor designed for live on-air broadcast, studio phone recording and editing. The system includes hot-key operation, waveform display and other live broadcast management and editing features.

The unit is Windows 2000-based and also will be available as a turnkey broadcast system with Windows OS software and soundcard.

The Digital Intern is available with a list price starting at $995.

For more information call (800) ENCO-SYS, (248) 476-5711, fax (248) 476-5712 or visit the Web site www.enco.com

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ERI LP-2E-DA-HW 2 bay Fm antenna, 105.9 MHz, less than 4 yrs old, changing freq. David Widener, WTFM/WKPT/WRZK, 423-246-9578 or davidw@wtfm.com.

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Components to build a three tower, two pattern 25 kW AM facility. Looking for cabinets, phasor parts, ATUs. Tom Hodgins, Alexandra Comm, 45 Campbell Rd, Walla Walla WA 99362. 509-527-1000.

4 to 8 bay antenna on or near 101.9, approx 400' of 1-5/8" coax, (2) 6' STL dishes & a set of audio prisms. Fred Willis, WXGJ, POB 388, Eastpoint FL 32328. 850-653-3648 or w.x.g.j.@gtcom.net.

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Yamaha BP-2 bass generator/pedals, schematic, literature. Would like electronics but schematic needed. Bob Meuse, Museaudio Arts, 191 E El Camino Real #209, Mtn View CA 94040. 650-969-2433.

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Ramko Research DC-8M, 8 rotary pot board, works very well, gd overall condition with manuals, $500/BO. Jim Canwell, Canwell Productions, 1629 W Cleveland, Spokane WA 99205. 509-324-0575.

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Fostex E-2, 2 trk tape recorder featuring center track for timecode, roll around cabinet, $1295, sell or trade. Dennis Scott, 615-309-8688 or ds.music@home.com.

Tanberg 15-21 Series 15 reels (2), like new, need belts, $60/pr. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952.

Tascam ATR-60, 2 trk mastering machine, warm sound, excel cond, $600. Jim Canwell, Canwell Productions, 1629 W Cleveland, Spokane WA 99205. 509-324-0575.

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ACTION-GRAM

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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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PAGE	ADVERTISER	WEBSITE URL
46	AKG	www.akgusa.com
64	Allied	www.ocwhite.com
57	Altronic Research	www.altronic.com
43	Aphex Systems	www.aphex.com
32	Armstrong Transmitters	www.armstrongtx.com
60	ATI	www.atiguys.com
48	AudioScience	www.audioscience.com
2	Auditronics/Wheatstone	www.auditronics.com
60	Autogram Corporation	www.autogramcorp.com
28	BALSYS	www.balsys.com
24	Belar	www.belar.com
60	Broadcast Data Consultants	www.broadcastdata.com
60	Broadcast Devices, Inc.	www.broadcast-devices.com
45	Broadcast Richardson	www.broadcast-richardson.com
17	Broadcast Software Int'l (BSI)	www.bsiusa.com
26	Broadcast Software Int'l (BSI)	www.bsiusa.com
60	Broadcast Technology Company	www.broadcasttech.com
62	Broadcast Tools	www.broadcasttools.com
36, 37	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
60	Circuit Werkes	www.circuitwerkes.com
64	Circuit Werkes	www.circuitwerkes.com
39	Commercial Communication Assoc.	www.cca.ws
7	Comrex	www.comrex.com
1	Continental Electronics	www.contelec.com
15	CRL	www.crlsystems.com
63	Crown Broadcast	www.crownbroadcast.com
62	D and C Electronics	www.dandcelectroincs.com
23	Denon Electronics	www.del.denon.com
12	Digigram	www.digigram.com
64	Econco	www.econco.com
19	ENCO Systems	www.enco.com
55	Eventide	www.eventide.com
62	Excalibur Electronics	See ad for contact information
30	Full Compass	www.fullcompass.com
28	Ghostwriters	www.radio-mall.com
35	Harris	www.harris.com
10	Inovonics	www.inovon.com
22	Inovonics	www.inovon.com
25	Inovonics	www.inovon.com
62	J Squared Technical Service	jsquared@cdsnet.net
60	JK Audio	www.jkaudio.com
14	Kintronic Labs	www.kintronic.com
41	Klotz Digital AG	www.klotzdigital.com
6	Logitek	www.logitekaudio.com
29	MediaTouch	www.mediatouch.net
53	Moseley Associates	www.moseleysb.com
62	Nott Ltd.	www.tjantenna.com
9	Omnia, a Telos Company	www.omniaaudio.com
33	Prime Image	www.primeimageinc.com
62	Progressive Concepts	www.progressive-concepts.com
59	Prophet Systems Innovations	www.prophetsys.com
18	QEI	www.qei-broadcast.com
31	Radio Frequency System (RFS)	info@rfsbroadcast.com
5	Radio Systems	www.radiosystems.com
64	Register Data Systems	www.registerdata.com
64	S.C.M.S., Inc.	www.scmsinc.com
38	Scott Studios	www.scottstudios.com
51	Sierra Automated Systems	www.sasaudio.com
62	Silicon Valley Power	www.svpa.com
40	Sine Systems	www.sinesystems.com
11	Sony Pro Audio	www.sony.com/proaudio
34	Studio Technology	www.studiotechnology.com
52	Syntrillium Software	www.cooledit.com
13	Telos Systems	www.telos-systems.com
71	Wheatstone	www.wheatstone.com
72	Wheatstone	www.wheatstone.com

◆READER'S FORUM◆

LA-2A

When I opened to page 45 of the Dec. 20, 2000 edition of RW, I was startled to see the picture of a piece of equipment that I had a significant part in creating: the Teletronix LA-2A leveling amplifier.

The LA-2A and other Teletronix products were the brainchildren of talented electronics engineer Jim Lawrence. In 1962, Jim had a small shop in Eagle Rock, Calif., and I was part owner and CE of KQXR(FM) in Bakersfield, Calif., where I also operated a small precision machine shop.

For several years I had manufactured parts for Jim to use in the various transmitter modifications he engineered, such as the conversion of many of the 10 kW General Electric FM transmitters to use the Eimac 4CX5000 tube.

Around this time, Jim got the idea for his leveling amplifier and built a few using a 5-1/4-inch rack panel with an off-the-shelf Bud chassis held to the back with a couple of long screws and wing nuts. A tiny Cal-Rad VU meter graced the panel. Jim told me that he had orders for more but did not have time to make the chassis, so I punched out a few more and wired them for him. Yes, there *was* a Teletronix LA-1!

A few weeks later, Jim said "Bernie, everyone likes the leveling amplifier but they are all asking for a drop-down front and a larger VU meter." I drove home to Bakersfield thinking about this and designed the chassis that is in your picture, a simple design that adapted well to my production equipment. I had components on hand from wiring the LA-1s, so I built the first LA-2 and a couple of weeks later laid it on Jim's desk. As they say, "The rest is history."

We made the first 50 or so LA-2s in Bakersfield, where my 14-year-old son did the wiring, all point-to-point. Jim had the panels silk-screened and added his patented opti-resistive gizmo after I delivered them to him.

I later moved back to South Pasadena, Calif., where Jim and I shared a building for our respective businesses. The LA-2A came into being when Jim changed from point-to-point wiring to mounting the resistors and small capacitors on terminal boards mounted inside the chassis.

The design of the chassis remained the same and I manufactured several hundred of them. I still have the original layout templates.

Bernie Marston
Life CPBE
Semi-Retired Broadcast Engineer
Yorba Linda, Calif.

Antenna interest

I have been following the development of EH and CFA antennas in RW with great interest. We are facing a possible loss of lease at our AM site and an antenna of this design would be of great value to us. I am glad to see that RW is giving the antenna fair and open coverage. Any new design should be carefully scrutinized by the engineering community.

There will always be those who find new ideas hard to accept. I had doubts, so I chose to build a scale model for the 20-meter ham band using Mr. (Ted) Hart's formulas. I took extra care to minimize the chance of feedline radiation and coupling to nearby elements that might reradiate the signal.

My results were quite surprising. The 10-inch-wide 8-inch-tall antenna performed equally as well as my factory-built Cushcraft R5 antenna in A/B comparisons. The EH performed better with contacts requiring a low radiation angle.

It was also found to be very broadband, covering 14.0 to 14.35 MHz with less than a 1.2:1 VSWR. Several other hams have confirmed similar results.

As I write this letter, Mr. Hart is still having problems obtaining experimental test authority for his antenna. I strongly urge those concerned with this antenna or with the advancement of the art in general to write the FCC in support of granting this test authority.

Paul A. Litwinovich
Director of Engineering
WSHU(AM/FM), WSUF(FM)
Sacred Heart University
Fairfield, Conn.

I have just read RW's interesting coverage of the CFA antenna in the Dec. 6, 2000 issue. However, I saw no mention of our subsidiary, LBA Technology Inc., which is actively investigating the CFA under an agreement that gives it exclusive rights in North and South America.

We have received our FCC experimental authority that authorizes full power CFA tests. This was the subject of a press release earlier this year. See *www.lbagroup.com/prcrossed.htm*

Lawrence Behr
CEO
LBA Group Inc.
Greenville, N.C.

Net Ad Interest Remains High

Recent turbulence in the world of dot-com suppliers has raised serious questions about the short-term future of radio's online ventures. However, it would be a mistake to jump off this particular bandwagon too quickly.

Radio broadcasters who are unsure that the Internet and streaming are viable components of their business might consider this: 65 percent of advertising agencies surveyed said they plan to recommend streaming media ads to their clients in the next 12 months.

For the "Advertising Agency Streaming Media Awareness Study," MeasureCast Inc. and The Yankee Group interviewed 100 advertising agency executives, half of whom worked for traditional ad agencies with online media capabilities (including media buying services) and half with online or interactive agencies.

And nearly half of the survey's respondents (47 percent) said clients who have not previously invested in streaming media advertising would allocate dollars to streaming ads in the next 12 months.

This is good news for stations that are now or are about to start streaming their content — there is a market for streaming media ads, which potentially can support a station's Webcasts.

Another aspect of this survey is important: a between-the-lines finding that agencies and media buyers view streaming media ads not as "value-added" perks to an on-air schedule, but as a separate, valuable product that they will purchase.

"Advertisers are recognizing that you have a very desirable demographic online — 'guys in ties' is how I've heard it defined," said Bill Piwonka, vice president of marketing at MeasureCast. "You have the ability to really brand your product (on the Web) in a way that has largely been unavailable up to now."

One hitch: slightly more than half — 54 percent — of the respondents said clients' perceptions that streaming media ads are too expensive kept them from purchasing these ads.

Piwonka said this is a perceptual problem, not a real one. Radio has to pick up the ball and change advertisers' thinking about streaming media ads. Show the value of this type of advertising to the buyers — educate them.

And radio has got to change its perception of the Internet as a money drain or a potential threat and embrace it as a part of its revenue stream.

So proceed, with caution. As with any new medium, naysayers will abound during shakeout periods. But the companies that plan well and keep their course stand to profit immensely later.

Armed with information and Net strategy, your sales team can win more dollars for your station and extend your brand into the World Wide Web.

How cool is that?

— RW

Write to Us

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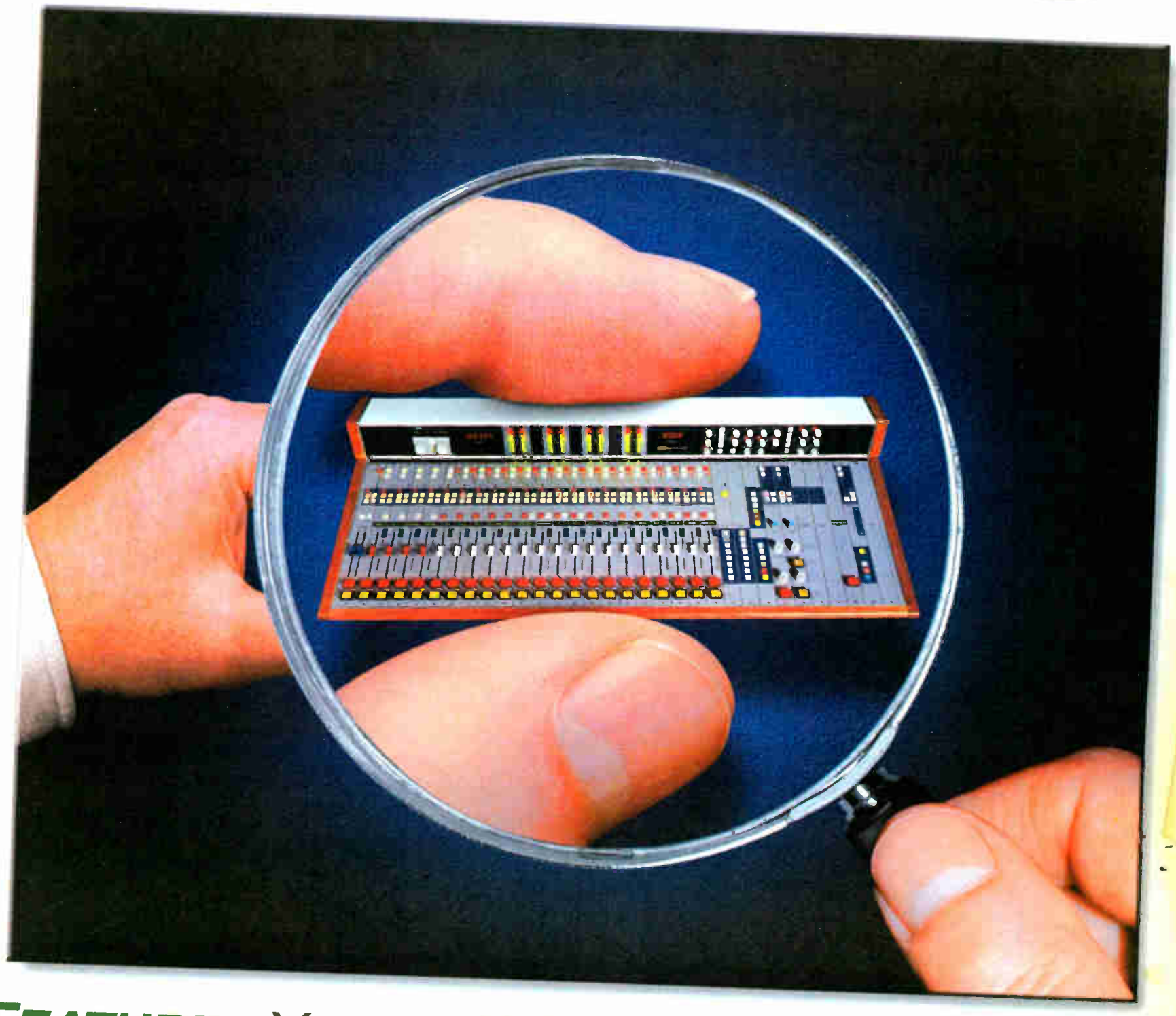

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