

*****3-DIGIT 857
S117298 D08 0103
TOM MILLER 712
ASST CHIEF ENGINEER
KTZR
2033 S AUGUSTA PL
TUCSON AZ 85710 7905

RF, Texas-Style
No longer on the sales block,
Continental is looking ahead.

The ABCs of dBs
Phons. Bels. SPLs. Inside
the history of the decibel.

Page 15

Page 43



Radio World

The Newspaper for Radio Managers and Engineers

December 5, 2001

INSIDE

ENGINEERING

▼ Clariti looks to expand wireless offerings using FM subcarriers.
Page 12

▼ FM consultants talk about sidelobes, multipath and you.
Page 16

INTERNET RADIO

▼ Some Webcasters are losing money at the rate of \$65 per thousand listener hours.
Page 33

▼ Why let the local newspaper corner the market on classifieds?
Page 36

STUDIO SESSIONS



▼ Reviews of the Harris ProCast economy console and Aphex 204 Aural Exciter.

In This Issue

COOL EDITING



▼ We give away a Syntrillium Cool Edit Pro 1.2a package.

Page 4



NewsBytes Now
Every Business Day
at www.rwonline.com

SPECIAL REPORT

Broadband: Radio's 3G Friend or Foe?

by Naina N. Chernoff

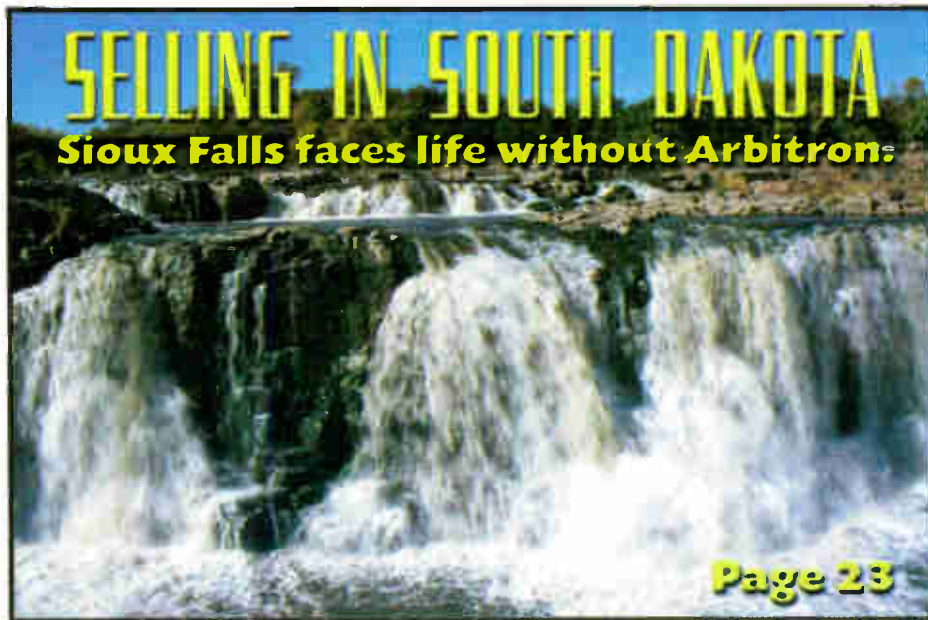
WASHINGTON The next generation of wireless technology seems poised to offer consumers an "always-on" broadband connection in the convenience of a handheld device, with more news and entertainment choices.

Known as 3G, the third iteration of mobile technology promises convenience and high-speed access, allowing

users to download music files onto their cell phones, get updated news feeds on their PDAs and receive personalized content through their car radios.

This technology represents another source that could compete for the attention of listeners in the car and other environments. Yet industry analysts say the new wave of services won't pose a serious threat to radio for

See BROADBAND, page 6 ▶



Page 23

Mediation Ahead in Scott Dispute

by Randy J. Stine

DALLAS A court-appointed mediator will try to resolve a dispute over audio file compatibility issues between program syndicator 4everadio Partners and automation supplier Scott Studios Corp.

The court-ordered meetings are scheduled for Feb. 28, 2002. The non-binding arbitration could negate the need for a court trial, tentatively scheduled for April.

\$8 million lawsuit

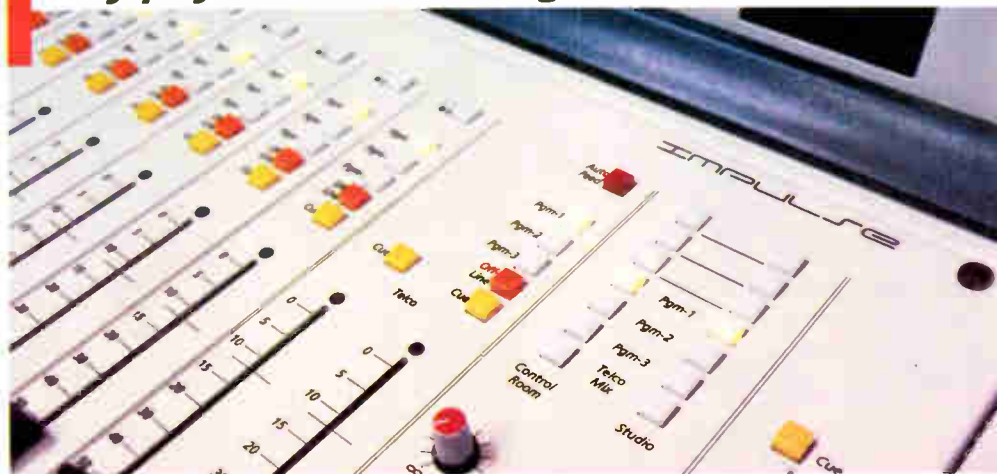
Syndicator 4everadio, under its chairman and CEO Lynn Christian, filed a lawsuit against Scott Studios Corp. earlier this year alleging fraud, deceptive trade practices and breach of contract. 4everadio seeks \$8 million in damages in the suit, filed in Dallas County Court in Texas.

4everadio executives claim Scott Studios misrepresented facts about the compatibility of its systems with other automation systems.

In a June 2000 meeting, Scott Studios employee Midwest Regional

See SCOTT, page 5 ▶

Why pay extra for analog?



Transition to digital on your timetable with the new Harris Impulse Digital Console by Pacific Research & Engineering. It can accept either analog or digital inputs and reconfigure from analog to digital easily — right in your studio. You can get the benefits of a digital console for less than the cost of most analog consoles. To find out more, call us today. Or, feel free to act on Impulse.

next level solutions
HARRIS

1-800-622-0022 • www.harris.com

◆ NEWSWATCH ◆

Sirius Plans Feb. Launch; XM Goes Nationwide

Sirius Satellite Radio plans a gradual product rollout to begin Feb. 14 in Phoenix, Houston and Denver.

Like its counterpart XM Satellite Radio, Sirius has chosen to begin product rollout in markets where commuters are in their cars at least an hour, the population is relatively young and previous consumer electronic sales have been strong.

Sirius hopes to have receivers in volume in stores by summer — thus giving XM the



Washington Mayor Anthony Williams, left, and XM Satellite Radio President/CEO Hugh Panero celebrate XM's rollout in the District of Columbia. Panero holds a Sony 'Plug and Play' unit for XM that retails for about \$300, including antenna.

advantage of being the sole company selling satellite-delivered digital audio broadcasting service for several months.

Sirius had delayed its launch, originally expected by the end of this year. Chief Executive Officer David Margoese stepped down in October. Getting the receiver chipsets from chipmaker Agere, formerly Lucent Technologies, to receiver partners also has taken longer than expected.

"The chipset works and production will begin shortly," said Sirius CFO and interim co-CEO John Scelfo in November. Supply of receivers to stores, he said, would not be an issue. The gradual launch is meant to ensure that, he said.

"You want to be able to control quantity of supply," he said, to make sure the consumer has a positive experience.

Kenwood, Clarion, Jensen and Panasonic will produce the first Sirius radios.

Certainty about the chipsets and revised launch plans calmed some anxiety on Wall Street about the viability of Sirius

See NEWSWATCH, page 3 ▶

Index

FEATURES	
Today's Engineer in Today's Radio Industry by Troy Pennington	10
Finding New FM Revenue on the FM Band by Naina N. Chernoff	12
Continental Is Looking Ahead by Bill Ryan	15
Sidelobes, Multipath and You by Richard J. Fry	16
Workbench: Nice Things for the Staff and You by John Bisset	19
In Spain, Saying Goodbye to Analog by Raúl Llarull	20
The 'Broadcast School in a Box' by Eric Shoars	22
GM JOURNAL	
Marketwatch: Sloux Falls Succeeds in Isolation by Bob Keyes	23
Traffic Guild Seeks Salary Info by Laura Dely	27
Gracie Awards Deadline Nears by Laura Dely	30
INTERNET RADIO	
Web Watch: Net Radio: Shakeouts and Pullbacks by Craig Johnston	33
Online Classifieds: NTR Gold by Lisa M. Osborn	36
STUDIO SESSIONS	
Harris Joins Small-Mixer Fray by Alan R. Peterson	39
Aphex: Big-Bottomed Excitement by Bruce Bartlett	40
How to Make Sense of Decibels by Blažo Guzina	43
Make the Most of a Small Space by Ty Ford	49
OPINION	
	54

BIG EASY

TECHLINE STUDIO FURNITURE

Easy to INSTALL – Easy to AFFORD!

- machine-tapped rack rails
- built-in top and bottom ventilation
- removable doors
- punchblock enclosure available
- compatible with Wheatstone Wiremax System
- available with type 66 or Krone™ blocks
- modular design for variety of configurations
- both standup and sitdown heights
- above counter turret accessories
- fast installation
- generous wireways
- built-in levellers



STARTS at \$2900



Available options include prewired punchblocks

OUR HIGH-STYLE TECHLINE STUDIO FURNITURE

boasts uncompromising **QUALITY** tailored to the **TIGHTEST BUDGETS**, with all the features a well-designed studio calls for. **A TRULY COST-EFFICIENT SOLUTION FOR YOUR NEXT STUDIO PROJECT!**

Wheatstone Corporation

tel 252-638-7000 / fax 252-635-4857 / sales@wheatstone.com / www.wheatstone.com

copyright © 2001 by Wheatstone Corporation

NEWS ANALYSIS

FCC Questions Deal Process

by Leslie Stimson

WASHINGTON FCC Chairman Michael Powell is moving aggressively with plans to eliminate outdated commission rules.

Thus the agency is taking a comprehensive look at its criteria for reviewing radio transactions in light of consolidation since passage of the 1996 Telecommunications Act and the proliferation of new media.

In an effort to speed its sometimes-lumbering merger review process before new rules are finalized, the FCC has set up an interim procedure to process more speedily certain transactions that push the criteria limits and usually are set aside. NAB called that delaying process unjustified.

Limits eased?

The review is so comprehensive that it may affect radio's local ownership limits. Key questions the commission has raised are whether local ownership limits — the tiered approach that allows one entity to own up to eight stations in a market — should be changed or possibly eliminated. The agency wants comments about alternative ownership rules and whether the commission has the legal authority to make such changes.

At about the time the Telecom Act went into effect, there were about 5,100 owners of commercial radio stations. Now, the agency said, there are approximately 3,800 such owners, a 25-percent drop.

Numerical ownership limits are one of several criteria the FCC considers in determining whether proposed mergers are in the public interest and also meet its diversity of media goals.

Some critics say the commission's

review is a duplication of efforts by the Department of Justice, which also looks at large-dollar transactions. For advertising matters, the Federal Trade Commission also weighs in. The FCC previously has said its review is not duplicative; but that viewpoint seems to be changing.

Large-market broadcasters presumably would favor raising or eliminating local limits in order to continue acquiring stations. Smaller groups, independents and consumer watchdogs would not, believing that consumers benefit from diversity of programming choices with more owners in a market.

In light of radio's new competitors since 1996, the FCC is asking which market assumptions still hold and which do not.

"As Americans increasingly are willing to pay for information and programming by subscribing to programming services, like satellite radio services, for example, it is incumbent on us to define more precisely the goals of our competition analysis," the commission wrote in the NPRM.

The Justice Department assumes that radio advertising is unique and that stations set rates according to rates at other stations, rather than ad costs charged by other media in the market. The FCC asks if this assumption still holds.

The agency has stepped up efforts to redefine radio markets. The effort began about a year ago, when the commission asked whether its current contour overlap method for determining how many stations are in a market "might be undermining the legitimate expectations of broadcasters, advertisers and the public."

The FCC suggested using a definition such as Arbitron Radio Metros would more

accurately reflect the location of a station's listeners and the identity of stations perceived by advertisers to be in a market.

At the time, NAB said that was not a "valid regulatory definition."

The FCC has asked commenters to suggest definitions for markets not rated by Arbitron.

The radio market definition issue has been folded into the comprehensive review.

Faster review

In an effort to speed up its radio merger review process while it ponders the weighty ownership questions, the FCC voted in November on a procedure to handle pending applications.

Chairman Powell said the way in which the FCC "flagged" some radio transactions and let them languish unresolved for months was a "quagmire" and said it was regrettable there has been no clarification of how merger review decisions are made.

The FCC began setting aside certain radio deals in 1998 in an effort to organize what had become a heavy transaction review workload for its employees following passage of the Telecom Act. The practice is abhorred by telecom attorneys and the companies they represent trying to acquire deals through the commission, because there have been no set guidelines for resolving flagged transactions.

The practice has led to substantial radio transaction backlogs; 62 deals were cleared

out in one day in March. The FCC said in early November that eight more deals that had been unresolved for a year would be processed within the next 90 days.

"Chairman Powell and the FCC have done the right thing today in trying to bring an end to the commission's confusing and uncertain standards for dealing with radio mergers," NAB Executive Vice President Jeff Baumann stated.

"It is disappointing, however, that the FCC plans to keep in the interim the 'flagging' process that has resulted in long delays for hundreds of transfer application that meet all applicable standards. We hope the commission acts quickly to eliminate this unjustified procedure."

Mass Media Bureau Deputy Bureau Chief Robert Ratcliffe told Radio World that applications that raise competitive questions will still be flagged, but will be handled more quickly.

"If you file an application ... (that) would result in a single owner controlling 50 percent or more of the radio ad revenue in your market, that would cause your application to be flagged."

A transaction that would result in two owners controlling 70 percent or more of radio revenue in a market would also be subject to heavier scrutiny.

Although high market share by itself does not demonstrate market power, that power may be "inferred" when combined with high entry barriers, such as no available spectrum that would permit a new station to enter the market, the FCC stated.

Comments on MM Dockets 01-317 and 00-244 were due 60 days after publication in the Federal Register. ●

NEWSWATCH

► NEWSWATCH, continued from page 2 technology. Lehman Brothers analyst William Kidd stated in a report that the launch news marked the transition of Sirius from "concept to reality."

If Sirius meets its target of signing 200,000 customers in 2002, its \$375 million in cash reserves should take the company through the year, Scelfo said.

Like XM, Sirius pared operating costs this year. Sirius consolidated office space and now occupies two instead of three floors of New York's McGraw-Hill building.

Sirius expects to have receivers in volume in stores by the summer and planned to detail specific market rollout information at the Consumer Electronics Show in January.

Executives at Sirius said they can learn a lot from XM Satellite Radio by watching its product rollout.

Scelfo complimented XM's ability to create consumer awareness of satellite radio and said Sirius would "springboard" off that awareness to help its own launch.

XM President and CEO Hugh Panero had no comment on Sirius' delay. He said, "We'll build a product category that's big enough for both of us."

XM went nationwide Nov. 12, six weeks after its initial rollout in Dallas/Ft. Worth and San Diego, and planned to mark the occasion with events in several cities.

At an event at its Washington headquarter-

ters, cars containing XM aftermarket radios were on display, as was an early OEM radio, a Delphi-Delco head unit in a 2002 Cadillac DeVille. The unit lists at \$295, including antenna and installation.

Cadillac is offering XM as an option on its 2002 DeVilles and Seviles; GM expects to expand availability to another 20 or so models in 2003.

Catalog consumer electronic retailer Crutchfield Corp. said it sold more than 500 XM radios in the first 45 days they were available.

Programming is a big part of how consumers will be able to tell the difference between Sirius and XM. Both claim they'll have fewer spots than commercial terrestrial radio. Sirius has increased the amount of music channels it is offering to 60 from 50, and said it will keep them commercial-free. XM has 71 music channels. More than 30 are commercial-free and the rest are expected to have up to 5 minutes of spots per hour.

Sirius says research shows consumers don't want to hear commercials at all on music channels. XM disagrees.

"It's not that people hate commercials. It's when you have 10 in a row" that becomes a problem," said an XM spokesman.

Neither company has discussed projected spot loads on non-music channels.

— Leslie Stimson



**PULLING
YOUR HAIR
OUT OVER
VOICEMAIL!!**

CALL S.C.M.S., INC.

- ✓ 25 Years of Personal Service (1976-2001)
- ✓ Experienced Staff
- ✓ Competitive Prices for over 600 Quality Manufacturers of New Equipment
- ✓ Huge Stock of Rebuilt RF and Audio Gear
- ✓ Extensive Rental Fleet (RF, Codecs, Test Equipment, Audio, and More)
- ✓ Trade-Ins Welcomed
- ✓ Turnkey RF and Studio Installations Planning and Design.
- ✓ Custom Studio Furniture

YOU-KNOW-WE-KNOW-RADIO

800-438-6040 - www.scmsinc.com - Pineville, N.C.

FAX: 704-889-4540 e-mail: sales@scmsinc.com

You Can Be a Radio Angel Too

Did you know that angels walk among us?

Perhaps you doubt it. Read this letter, received by Gordon Hastings of the Broadcasters' Foundation, and judge for yourself.

"Dear Mr. Hastings,

"I am sending this on Labor Day because this year the holiday has special meaning for me. For one thing I am grateful to be around to enjoy it, and after months of cancer treatment I feel I am ready to get back into the work force. Hopefully we can now get back on our feet.

"Tomorrow I return to work. It will be great to be spending more time in a radio station than in a hospital.

"It has been a bumpy road but I am told the operation was successful. They also did some kidney work. Doctors said they did see not any remaining cancer. I also had some chemotherapy, which they said was necessary to cut the chances of recurrence.

"I want to especially thank you, Gordon, and everyone connected to the Broadcasters' Foundation for helping my family and me to cope financially with this trying situation. We had so many

decisions to make. Things to worry about. If it wasn't for your help, money problems could have been overwhelming.

"None of us know what tomorrow may bring, but I trust in God. I believe he has a future for this family. Through this experience I have learned that there are many caring people in our industry. Thank you again for your help. My family and I appreciate it more than I can say. God bless you.

"P.S. — I feel great."

★ ★ ★

Or this:

"Dear Mr. Hastings,

"I want to thank you and the board of directors of the foundation for the assistance you have afforded my daughter and me.

"Asking for assistance is not easy. But when electricity is cut off, old cars don't run and rent doesn't always get paid because she needs new clothes for school, you realize you have to reach out.

"Many of the traditional assistance organizations look at me and say, 'You graduated college. How come you don't have any savings, are you hiding

something. how come you don't have family to help, if you are not homeless there isn't anything that we can do for you,' etc.

"What the Broadcasters' Foundation does is allow for dignity, and that is appreciated as much as the financial support. Again, thanks to all concerned for changing the course of destiny."

★ ★ ★

Or this:

"Dear Gordon,

I am writing in regards to the outright grant your foundation gave to Linda. As you must know, she died in April. Her bone marrow was clean, no leukemia, but she was felled within 72 hours by a fungus. I found out it is the No. 1 killer of transplant patients.

"I just wanted to thank your association for the peace of mind and soul that you gave her during her fight with AML.

"She loved her job and the many colleagues she met. I was with her for seven months as her caregiver, and her main goal was to get back to her job. Thank you for making her fight easier."

This letter was signed by Janice McKee, Linda's mother. The late Linda Simmons was the executive director of the Alaska Association of Broadcasters.

★ ★ ★

Yes, there are angels among us, and if you have donated to the Broadcasters' Foundation, you are an angel too. If you have not donated, this holiday season is a great time to do so.

The foundation provides anonymous financial help to broadcasters and their families who are in acute need. It is the *only* organization in radio or TV that does this.

People who benefit are your colleagues and mine. Often their co-workers don't even know they are in trouble. These broadcasters must cope with terrible illness, death of a spouse, advanced age, accidents and other emergencies that

From the Editor



Paul J. McLane

overwhelm their resources.

The foundation has also established a special fund for the broadcast engineers who died in the World Trade Center tragedy.

The charitable organization was founded in 1942 by broadcaster HV Kaltenborn, and was known as the Broadcast Pioneers until 1995. It uses a careful application process and has delivered more than \$1 million over the years, from small monthly aid to emergency medical grants.

You may know of the foundation through its golf tournaments and Golden Mike Awards. You may not know that its only staff is Gordon Hastings — a gracious and devoted man, born to this job if ever anyone was — and a single part-time assistant. But the group has many prominent friends and supporters in the industry. One hundred percent of its endowment fund, begun three years ago, goes to outreach.

In keeping with its anonymous policy, I've changed a few of the medical facts in the letters above to protect their confidentiality. But virtually all of the words are theirs. And the letter from Ms. McKee appears as written, released by the foundation with permission.

You can help by making a gift or becoming a member.

Visit www.broadcastersfoundation.org, send e-mail to ghastings@broadcastersfoundation.org or call the group in Connecticut at (203) 862-8577.

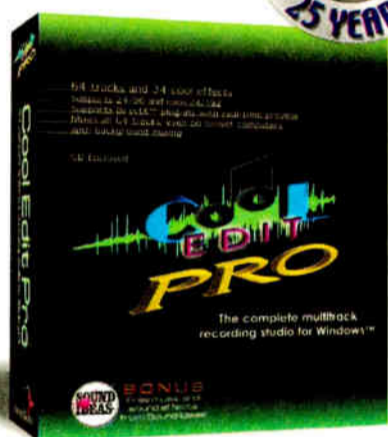
Thanks for anything you can do to help our colleagues in need. ●

Our prize in the Radio World Silver Sweepstakes this issue is Syntrium's Cool Edit Pro 1.2a with MP3 Plug-In. The winner: Frank Hicks, CPBE, a life-long Houstonian who has been reading Radio World almost as long as we've been publishing it.

Cool Edit Pro is simple to learn and packs top-quality digital effects modules. It can mix 64 tracks together, using almost any sound card. It's like having thousands of dollars' worth of pro audio equipment in an easy-to-use software package.

With the MP3 plug-in, Frank can import and export MP3 files in Cool Edit Pro using a high-quality process based on Fraunhofer's MP3 codec.

Retail value: \$428.



Which Transmitter Control System is Right for You?

- Front Panel Display
- Site-to-Site Control
- 16 - 64 Channels
- Studio Control with Flexible Communications



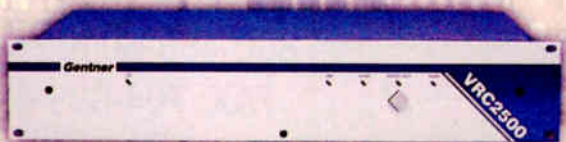
ARC-16

- 85 Sites
- 8 - 256 Channels / Site
- Built-in Macros



GSC3000

- Single Site Solution
- 16 Channels
- Built-in Macros



VRC2500

Burk is proud to add the GSC3000 & VRC2500 to our product line, giving you more choices with our continued high level of support.

BURK
TECHNOLOGY

Phone: 1-800-255-8090
Email: sales@burk.com
www.burk.com

Scott

► Continued from page 1

Sales Manager James Hammond "made continued representations that the compatibility between the Scott systems and competitive brands was going to be no problem, or at best, a minor problem and that it could be easily solved for either 'no money' or for a 'couple of thousand dollars,'" 4everadio stated in the lawsuit.

Scott Studio executives argued that the lawsuit is a smokescreen to cover for 4everadio's lack of preparation.

Alleged losses

In the lawsuit, 4everadio cited several examples of lost business to the alleged deception by Scott. For example, 4everadio claimed its Florida affiliate expected to carry its adult standard 24-hour Forever Young format beginning in March 2001 but was unable to do so because of incompatibility between different automation systems.

According to the lawsuit, 4everadio's Scott Voice Trax 32 system — on which the programming was produced — was incompatible with a Computer Concepts' Maestro system at WQJM(FM) in Panama City, Fla. 4everadio alleges it lost the contract because of the non-compatibility issue. 4everadio planned to deliver voice tracks, music and jingles via the Internet or on CD.

Charlie Whitaker, president of 4everadio, said Scott engineers promised to furnish 4everadio with the file conversion software needed to convert Scott files to play on a Maestro system.

pany also lost a sale to a Boston radio station that had automation equipment that was not compatible with those of Scott Studios. The station is not identified in the suit.

Whitaker said also at issue is Scott Studio's failure to adhere to guidelines set down by the proposed Audio Engineering Society's "Cart Chunk" standard for audio file interchange (see sidebar).



'Sludge,' the afternoon jock at WKQX(FM) in Chicago, is shown with his Scott Studios SS32 touchscreen digital audio system.

According to the Cart Chunk Web site, www.cartchunk.org, Scott Studios and 15 other digital systems comply with the proposed industry model for playing and transferring audio files. The Computer Concepts' Maestro is not on the list.

However, the site states, "The product information and compliance claims listed here are those of the manufacturers and not of Cartchunk.org." Therefore, the appearance of any manufacturers name or product does not constitute a certification of compli-

4everadio executives claim Scott Studios misrepresented facts about the compatibility of its systems with other automation systems.

"But Scott failed to provide this information as promised. When we urgently requested this information we were told the file conversion convention was not available. Dave Scott confirmed this over the telephone with 4everadio," Whitaker said.

Scott Studios executives maintain the company had the software 4everadio needed to convert the files play on a Maestro system, but that 4everadio did not act quickly enough.

"Scott Studios is not the cause of 4everadio's problems," said Dave Scott, president of Scott Studios Corp. "Everything was represented accurately. Equipment issues are a smokescreen because 4everadio accepted a contract but wasn't ready to deliver after two years of preparation," Scott said.

He described 4everadio's management as non-technical. "They don't even have an engineer on staff," Scott said.

4everadio's lawsuit stated the com-

ance or compatibility.

As for the Maestro being unable to play files from the Scott Voice Trax 32, Dave Scott said, "Long-term we figure to have the Maestro Cart Chunk-compliant." Computer Concepts Corp. is a wholly owned subsidiary of Scott Studios Corp.

Compatibility issue

Whitaker dismissed claims made by Scott that 4everadio was unprepared and that it should have been aware of the incompatibility problems between the two systems.

"It was Dave Scott himself who notified us on March 20, nine days before the deadline (for the Florida station) that the Voice Trax 32 was not compatible with the Maestro or with any other brand of automation," Whitaker said.

Scott said 4everadio gave his company short notice of the problem.

"We have the Trim, Label and Convert software that can convert Scott files to play on a Maestro and vice versa, but 4everadio waited until nine days before the air deadline before asking for help," Scott said.

Lynn Christian, 4everadio chairman and chief executive officer, stated in a press release, "It's unfortunate that we have been forced to take this action, but it would be irresponsible of us to fail to protect our business and our partners' investment."

Repackage

4everadio's press release also stated the compatibility issue halted operations of the company. 4everadio is attempting to repackage its adult-oriented programming as a nighttime show called Easy Oldies. Whitaker said the company had yet to sign any affiliates for its Easy Oldies show as of late October.

"We are aggressively moving to re-launch the service. We are definitely moving forward to build the company," he said.

4everadio was started about two years ago with music programming aimed at adults 40 to 64. The program syndicator hopes to sign MediaTouch as its new automation supplier.

"We would like to work with them, but we are not sure in what fashion at this point," Whitaker said.

Scott Studios has approximately 3,900 radio stations using its Scott Voice Trax systems and Computer Concepts' Maestro products.

Cart Chunk Update

The Standards Committee of the Audio Engineering Society was expected to take further action this year on the proposal to make Cart Chunk protocol the industry standard for audio file transfers between digital products.

"It likely will move into the public comment phase soon," said Dick Pierce, one of the principal authors of the Cart Chunk Specification (RW, Sept. 1, 2000).

The AES Standards Committee was set to meet at the AES Convention, re-scheduled for Nov. 30 to Dec. 3 in New York.

"Cart Chunk is the basic means of having two disparate systems send audio files back and forth to each other with 'label' information attached in an agreed-upon format," said Geoff Steadman, broadcast consultant and co-author of the Cart Chunk proposal.

Industry observers believe the Cart Chunk specification will help reduce the expense and complexity of moving audio files from one platform to another.

For a list of suppliers and vendors who comply with Cart Chunk specifications visit www.cartchunk.org.

— Randy Stine

radio SYSTEMS • MILLENIUM CONSOLES

601 Heron Drive, Bridgeport, New Jersey 08024
(856) 467-8000 voice (856) 467-3044 fax www.radiosystems.com



Disaster Relief
From now until the end of the year, Radio Systems will donate \$100 for every console sold to the American Liberty Partnership.

SMART CHOICE

- EXCELLENT VALUE**
The bottom line is that Millennium consoles work because their performance, look and sound present the best console value around.
- PROVEN**
Over 500 broadcasters use more than 3000 Millennium and RS series consoles to stay on the air every day. Most users who have bought one of our consoles bought another.
- FULL FEATURED**
You can buy options for a Radio Systems console — but you don't have to! From full remote control to complete monitoring, Millennium consoles work right out of the box!
- GREAT LOOKS**
Millennium consoles are beautifully styled with glowing soft-touch keypads and rich mahogany side-panels. And, owners can even inexpensively update their older consoles to a Millennium model.
- GUARANTEED**
Our consoles come with the best warranty in the business with 2-year no charge overnight parts delivery to keep you on the air.
- EASY INSTALLATION**
Make an afternoon out of installing your next console — not a career! These boards almost seem to wire and install themselves.
- SUPERB ENGINEERING**
These boards have the low noise and distortion specs that you need to compete with digital alternatives. And full DC control and modular construction keeps the performance clean and repairs a snap for the life of the console.



Broadband

▶ Continued from page 1
some time.

Wireless companies in the United States are at least two years away from deploying 3G services. Initially, the cost to deliver a similar type of service to radio will be prohibitive.

In a report by Ovum, an international analyst and consulting group, experts predicted that because of slow deployment of 3G, mobile streaming will not reach the mass market until about 2005. They blamed delays associated with the buildup of new wireless networks and device limitations.

"(Broadcasters) don't need to worry about people coming to destroy their business," said Dario Beti, an analyst at Ovum, based in the United Kingdom. "People will still use radio stations because they want local info, humor and different songs."

Mobile streaming

Beti urged broadcasters to view mobile streaming of audio and video content as a complementary technology to conventional broadcasting. Stations, he said, could increase their revenue streams by figuring out how to integrate their offerings with the new types of services.

Others agree with that conclusion. John Marino, NAB's vice president of science and technology, said radio broadcasters are exploring their options.

"The broadcasters are looking at the technology as another platform to put content on," he said. "They are not viewing it as strict competition."

For many stations, he said, using the Net to promote itself is still a new concept, while other stations are exploring different avenues for distributing content with 3G.

Once 3G is deployed, Marino believes most stations will provide streaming audio of their own over an Internet Protocol network. One example would allow a user in New York to listen to a radio station in Los Angeles.

In spite of the hoopla over 3G, radio broadcasters apparently don't have to figure out their game plans just yet. Station executives and engineers have a couple of years to figure out exactly how they'll use the technology to their advantage.

Though many wireless companies have been investing time and money into 3G for a while, it is unclear when the technology will be introduced.

Because of the scarcity of available bandwidth and the large number of incumbent users that would need to be relocated, the FCC has been scrambling to find spectrum for 3G. While the agency has engaged the industry in a heated dialog about which portions of the airwaves will be used for 3G services, it has little to show for it so far.

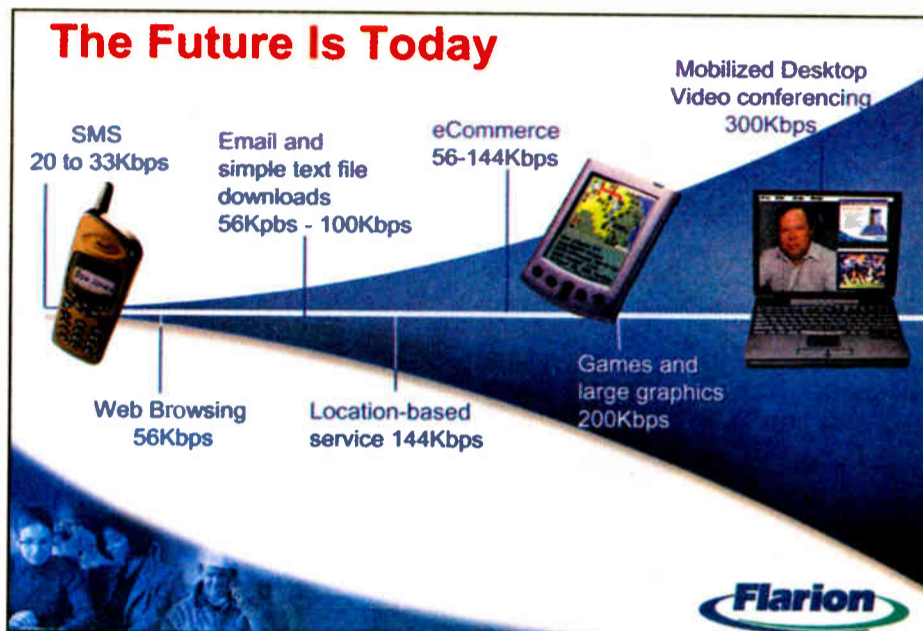
Recent decisions by government agencies indicate that options are dwindling and those decisions have delayed the auction of 3G spectrum further. Together with the National Telecommunications and Information Administration and the Department of Defense, the FCC announced a plan in October to remove a portion of spectrum from consideration and identify other bands suitable for 3G.

as beneficial.

Despite the huge revenue potential that 3G wireless companies in the United States tout, forecasters predict that consumers are likely to spend about the same amount of money they are paying for wireless services. According to Ovum, operators in Europe have spent \$100 billion to acquire 3G licenses and millions to build up networks. While struggling to recover the hefty investments in spectrum, the carriers plan to introduce the service in 2002.

Return on investment

Which begs the question: How do wireless companies that have paid or will pay millions of dollars to obtain 3G licenses and build new networks earn a return on their investments?



Flarion is one of several companies developing alternatives to 3G that will provide some of the same services.

Before the events of Sept. 11, the commission had designated 1770-1850 MHz as a potential home for 3G services. Now, however, with national security considered a higher priority, the FCC has few grounds to ask defense users to vacate the spectrum.

The new plan, called a compromise by the FCC and the Commerce Department, of which the NTIA is a part, calls for the assessment of the possible use of the 1710-1770 and 2110-2170 MHz bands for 3G. Expected to be finished by late spring of 2002, the assessment will be followed by an auction deadline for both bands in September 2004.

Some countries have deployed or are closer to launching 3G services. But the delay in the United States could be seen

In Japan, the nation's largest wireless company is testing the waters. In October, NTT DoCoMo became the first company in the world to launch its 3G service, called Freedom of Multimedia Access, and signed up more than 4,000 consumers in Tokyo on its first day of service.

FOMA users have a choice of two services for data communications, a maximum downlink speed of 384 kilobits per second and a circuit-switched service or an uploading/downloading speed of 64 kbps for large-volume data, either of which will allow users access to images, videos and music.

Marino believes the United States is watching the experiences of other countries, like Japan, before making the leap entirely into the 3G marketplace.

Moreover, he said, the state of the U.S. economy is slowing down the development of broadband. "Companies that can provide services haven't been fast to jump on the bandwagon."

Robert Berzins, managing director at the New York analyst firm Lehman Brothers, said he has noticed that trend as well. The economy, he said, is having a direct impact on 3G. In addition, he said investors and consumers are pessimistic. Both have heard promises for some time.

The trade group that represents consumer electronics manufacturers also detects a lack of interest by consumers in high-tech mobile applications.

According to Sean Wargo, senior industry analyst at the Consumer Electronics Association, consumers are not eager to acquire the latest services. He believes consumers are not yet ready to pay for high-end applications such as streaming audio or video but says they have expressed interest in applications such as mobile e-mail. "They're just looking for some of the gravy."

Wargo said wireless companies need to gradually phase in wireless applications to American consumers, who, unlike Japanese users, are attached to their landlines rather than their wireless phones. There is time to do that, he said, adding that he believes U.S. wireless carriers will deploy 3G in the next two to five years.

One interim measure, Wargo said, might be for wireless carriers to make the jump to 2.5G first, which would provide them with more bandwidth and allow them to offer applications such as e-mail that consumers want.

"Two-point-five would prime the pump to get consumers interested in more advanced services," he said. "It might help support a better rollout for 3G."

Like others, Wargo also views 3G as an opportunity for broadcasters to shift their business model to include an online version of its local content so that users can listen to stations on their wireless devices. But, he said, broadcasters won't be the only ones who choose to provide local content on wireless devices.

The new technology opens up the market to allow other companies to provide content to listeners, Wargo said, adding that he anticipates several partnerships between broadcasters and 3G service providers for content.

Several tech companies are creating alternatives to 3G that will provide some of the same services.

One example of a company developing

See BROADBAND, page 8 ▶

Public Service Announcement

The BlueBox is a new POTS codec from Comrex. This codec delivers the audio quality of our Matrix and Vector codecs (15 kHz on a standard dial-up line) at the entry-level price of our HotLine, just \$2800. It also adds features such as wireless operation, field upgradability, and a cellular hands-free interface, and remains completely compatible with all our POTS codecs.

Since the HotLine is so popular, we decided to provide a "heads up" in advance of replacing it. To this end:

- 1) The BlueBox will begin shipping in February 2002, and the HotLine will be taken out of production.
- 2) We'll continue to support the HotLine for many years to come.
- 3) If you can't wait for the BlueBox, you can buy our remaining HotLines at the new price of \$1995 (while supplies last!)

We at Comrex hope this helps. If you want to talk about the options or try a demo of any of the Comrex codecs, give us a call at 800-237-1776.

If you want a small 15 kHz POTS codec that can also work on wireless circuits but only want to pay \$2800, you can wait and buy the BlueBox in February.

Choice A
The BlueBox: \$2800

Choice B
**The HotLine:
\$1995**

If you need a POTS codec today, if 7 kHz is more than enough, or if you just want to save money, you can purchase the HotLine for \$1995. But don't delay, there is limited stock available.

Radio: Cheap Pipe Into the Car

Wireless telephone companies have the lead so far in setting up the infrastructure to have the fattest data delivery pipe into the car. But companies developing digital radio are eyeing that pipe and positioning radio to get some of the profits predicted to come from wireless data services.

Wireless data revenue is projected to grow to \$63 billion by 2010, according to Morgan Stanley Dean Witter. While most of that revenue will flow to devices such as cell phones, pagers and PDAs, Ibiquity Digital Corp. predicts broadcasters can garner an estimated \$5 billion of that, said Director of Business Development Joe D'Angelo.

Compared to cellular technology, radio offers an inexpensive pipe to the car. For wireless technology to work, base stations must be built every few miles. Upgrading to 2.5G and 3G systems will require more base station construction. Wireless companies will need to purchase more spectrum in government auctions to upgrade the transmission systems, leading to an investment that could reach as much as \$400 billion, according to some experts.

Efficiencies

Radio, by comparison, will use the same spectrum it occupies now when it goes digital. One tower can effectively cover an entire metropolitan area, making it an inexpensive way to transmit data.

While broadcasters have an income now from FM subcarrier services, IBOC promises more data capacity.

"We think many folks interested in delivering wireless data services will offer applications for broadcasters to deliver for their own benefit, or (make) offers to purchase capacity to use to deliver the services," said Ibiquity Vice President of Wireless Data Development Patrick Walsh.

Ibiquity, now the sole developer of terrestrial digital radio for this country, has an agreement with Impulse Radio to work with radio, consumer electronics and automotive industries to develop a common data application platform. Ibiquity wants to ensure that when a company develops data applications for IBOC, the application can run on several devices.

However, Ibiquity's relationship with Impulse is not exclusive, said Walsh, pointing to Command Audio and Cue Corp. as two other companies developing IBOC data services.

Under the Ibiquity plan, FM stations can convert to IBOC for costs that can

range from \$30,000 to \$200,000. Those costs would enable stations to deliver both digital audio and data services. The Ibiquity system is designed to be flexible, allowing stations to devote portions of their digital signal to audio programming and the rest to data services.

For example, in the FM hybrid mode, the Ibiquity system will support delivery of up to 150 kbps of data, said Walsh. Broadcasters can determine the data rate by determining how much of the bit-stream is devoted to audio programming vs. how much is devoted to ancillary data transmission. Broadcasters can increase the amount of throughput for data services by trading off the amount of throughput dedicated to digital audio.

For FM in the all-digital mode, the throughput for audio and data services doubles to 300 kbps.

Satellite digital radio companies Sirius Satellite Radio and XM Satellite Radio — and their investors, DaimlerChrysler, Ford and General Motors — have the ability to use some of the S-band spectrum devoted to satellite-delivered digital audio broadcasting to transmit data services to vehicles. For example, XM receivers in stores now display artist and programming information in text form.

IBOC radios will have these same text displays, and the capability to store programming such as weather or traffic reports, for playback at a listener's convenience. Receiver manufacturers likely will incorporate more advanced features, such as a "buy" button on the display, in the second generation of IBOC and satellite-DAB radios.

XM has receivers in the market now, Sirius expects to have product in February 2002, and Ibiquity plans to

introduce receivers at the Consumer Electronics Show in January 2003.

If Ibiquity meets its timetable, the more ambitious data applications could be available in cars by 2005, Walsh said.

For all their expense, wireless technologies have an advantage over broadcasting for delivering data, the capability of two-way communication. Automakers have begun to introduce two-way communication capability, such as GM's OnStar, in cars.

With cellular communication already in the vehicle, the "buy" button becomes easier to implement, said Walsh. "IBOC is an inexpensive way to deliver digital data to the car, push the button, and have the data go back to a call center or Web server" which would then take the response from the consumer, he said.

—Leslie Stimson

What do you get when you cross a Matrix with a HotLine?



The BlueBox:
The audio quality of the Matrix at a fraction of the price.



Order yours today!

15 kHz on a single POTS (Plain Old Telephone Service) line for **\$2800!**

Want to save even more \$\$\$? Buy a HotLine for just \$1995 while they last!

Please note

The *Matrix* with its modular design is available if you want the ultimate in flexibility and future-proof ability.

If you need the convenience of an integrated 4-channel mixer, the *Vector* is available.

The *Matrix Rackmount* is an appropriate studio version for any of these portable codecs.



Comrex Corporation, 65 Nonset Path, Acton, MA 01720 USA
Tel: (978) 263-1800 Fax: (978) 635-0401 Email: info@comrex.com
Toll-free in North America: (800) 237-1776

COMREX
www.comrex.com

Broadband

► Continued from page 6

the tools for a wireless Internet is an Atlanta-based software developer, MobileSoft. It sells software technology that will allow users to personalize audio content on their PDAs, cell phones with built-in MP3 players or in-dash products for the exact length of their daily commute. A user will be able to transfer a personalized show each day from the Net to a mobile device at a cost of \$60 to \$195 per year.

"Today, (commuters) are stuck on highways with 18 minutes of commercials an hour blasted on the radio," said MobileSoft's CEO Michael Price. "I think people want a better choice and historically, as seen with cable and satellite, have been willing to pay for it."

MobileSoft is marketing its software, MobileMedia, to publishing and media companies, Price said, and to firms that specialize in particular areas of business to provide professional users with specialized news.

In the same way broadcasters must adjust to upcoming 3G services, Price believes stations should partner with personalized audio service providers and view the service as complementary. He foresees networks and station groups striking deals with the providers to push their content to users.

Another company, Flarion, is preparing to launch a proprietary technology in late 2002 that can be used by passengers in a car or a train to receive wireless data through a laptop, PDA or cell phone.

Using its flash-Orthogonal Frequency Division Multiplexing technology, similar to the modulation system used for

audio and digital television, Flarion's system works much better than 3G for data, according to spokesman Bill Casey, and is more affordable to consumers and service providers.

With Flarion's technology, Casey said, service providers who partner with the company can provide broadband access to any type of data available on the Internet, including the growing arena of Internet radio.

But like some other observers, Casey believes the service will not compete with the car radio, at least for the driver, who will not have access to devices using Flarion's technology and will still rely on the radio for news and entertainment.

"For data, we're it. But for local info, it's radio," Casey said. "I think our technology and radio will co-exist."

How will do you think broadband will affect radio? E-mail your opinion to radioworld@imaspub.com. 🌐

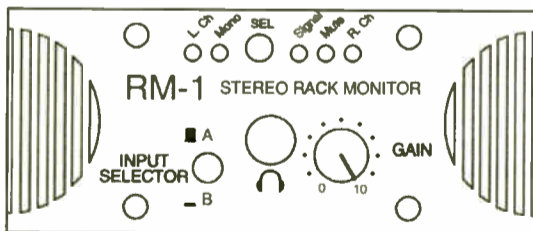


Insert Tab A



How to Monitor in a Tight Situation

The new RM-1 is the ideal solution for monitoring needs in tight industrial environments. It's the perfect speaker for machine rooms, VTR monitoring, surveillance, mobile and stationary control rooms, theme park applications or any other situation where monitoring is needed and space is tight.



Features include:

- Dual Stereo Inputs with independent volume controls.
- Switchable Matrix [L/R/Mono/Stereo] with high intensity multi colored LED's which tally the mode selected.
- Signal Presence/Amplitude Indicator.
- Balanced and Unbalanced I/Os.
- Universal Stereo Headphone jack with ample volume for noisy machine room environments.
- Fully shielded to prevent interference with video monitors or VTR tape machines.

The RM-1 employs a unique new driver technology that results in outstanding frequency response, considering the limited space enclosure. This revolutionary transducer was developed by Foster Electric, the parent company of Fostex America.



Fostex

www.fostex.com

15431 Blackburn Ave. Norwalk, CA 90650 • 562.921.1112

IBOC Q&A

Digital STLs

This is the second in a series of articles in which representatives of Ibiqity Digital Corp. answer common questions about the implementation of in-band, on-channel digital audio broadcasting. Broadcast Technology Manager Jeff Detweiler answers today's query.

Q: Do I need a digital studio-to-transmitter link for IBOC compatibility?

A: You do not need a digital STL to implement IBOC. However there are a number of factors you should consider before you decide one way or the other.

Present manufacturer plans call for AES-3 digital audio standard as the source for an IBOC exciter. The point at which you convert audio to an AES stream is dictated by the overall facility design.

In facilities that have separate studio and transmitter sites, some means must be provided to deliver the studio's audio and data to the transmitter site. If audio processing will be located at the transmitter site, a common analog STL system may be employed because its output can be fed to the two independent audio processing chains (one for the IBOC digital system and one for the analog).

If processing is located at the studio, two independent audio streams must be sent to the transmitter site. This may require installing a new digital STL system.



As for throughput, IBOC FM is capable of reproducing the audio spectrum to 20 kHz. It would be desirable to have an STL capable of the same bandwidth. Do not dispose of the old FM STLs, however. They can be used in IBOC AM systems, which deliver FM-like quality with a 15 kHz response.

IBOC AM radio, like its FM counterpart, is a stereo-capable system and will dictate the use of a stereo program path. This can most readily be accomplished if a discrete channel analog or digital STL path was used at the FM station. You also can retrofit composite STL systems with digital encoding and decoding equipment to provide either AES/EBU or discrete audio channels.

STLs using bit-rate reduction must be carefully considered for compatibility. STL development has centered on reducing the bandwidth requirements of both RF- and telco-based digital STL systems. In the case of RF-based systems, this was to facilitate a digital path within the limited RF spectrum of the STL channel.

Bandwidth optimization has also been employed on telco-based systems to lower the cost of data lines. Stations that employ compressed STL channels should critically evaluate the potential for artifacts that may result from coding incompatibility.

If the STL uses coding, consider moving your processing to the transmitter site. Perceptual coding techniques rely upon dynamic models as they relate to audio metrics. If critical harmonic relationships are disturbed in the source audio fed to the coder, undesirable anomalies may occur in the decoded audio.

While not required, many stations may benefit from digital STL technology. A careful review of equipment location, throughput and potential for transcoding issues will guide your decision.

Send your IBOC questions for a reply in this space. E-mail to radioworld@imaspub.com. Radio World welcomes other points of view. 🌐

CLEARLY NOT FOR EVERYONE

Your Grandmother is certainly a very nice lady, but a Porsche is probably not her ride.

It's the same with processing: Some people should stick with the conservative stuff. Give them something too fast and they just won't know what to do with it.

Frankly, the new Omnia-6 is probably not for them. It's just too potent, too flexible.

On the other hand, maybe you are the sort who can run a fast machine. Who loves the thrill of smooth power. Who revels in the admiration of others.

Omnia-6 - if you can handle it.



www.omniaaudio.com

North America: +1.216.241.7225

Europe: +49.81.61.42.467

Omnia is used on 4 of 5 leading stations in New York, 2 of the 3 top stations in Los Angeles and 5 of 6 of the most listened to stations in the US. It's on the leading stations in Paris, all of the BBC's FM stations in the UK, and the number one stations in Canada, Ireland, Germany, Finland, Australia, India, China, Denmark, and Sweden.

SBE NEWS

Today's Engineer in Today's Radio Industry

Troy Pennington

The author is national president of the Society of Broadcast Engineers. Radio World provides this space to the society as a service to the industry.

Perhaps now more than ever before, the technical members of our profession are facing issues that challenge the survival of this industry we so cherish.

The broadcast engineer's role today is crucial to keeping our stations and production facilities solvent and competitive. We must realize that the part we fulfill in our individual station's organizational structure is vital to the success of the facility, and ultimately to this business we call broadcasting.

Proven worth

Broadcasting has for a long time provided a viable livelihood for those of us on the technical side of the industry. This career also offers intrinsic rewards that bring a sense of real satisfaction when a job or project has been completed successfully.

We work hard to prove how valuable we are to our stations' managers and owners. And we are starting to receive much deserved credit for it. I feel our stations are proud of us, their engineers.

Today, the broadcast engineer is one of the most valuable resources to his or her company. The engineer's professional opinion increasingly is becoming an important component in the managerial decisions that ultimately affect the financial welfare of our facilities.

Broadcasting has been an intriguing business for investors for a long time, and today that interest is more intense than ever. The role we play in the broadcasting profession has contributed to many of the successes that our companies have experienced.

We have helped build these compa-

nies and assisted in guiding them to the valuable properties they have become. It is proven that broadcast engineering is no longer a necessary "fixed cost" of a station. In a good operation, it is considered to be an asset, and its opinions are highly solicited and considered.

Leadership

This ever-changing industry is bringing more responsibilities to the technical roles we play. We must be willing to accommodate the changes of this "new-age media" or be complai-

ing, group owners are listening to us and are considering our valuable input. This makes for a "win-win" arrangement, so vitally needed in today's competitive business environment.

Large investments are being made in broadcast groups. Shareholders demand a return on their investments and ensuring these returns takes prudent decisions based on sound resources.

Top management talent has been put in place to oversee operations in a way that hopefully ensures a return on the investment dollar.



The engineer's professional opinion increasingly is becoming an important component in the managerial decisions that ultimately affect the financial welfare of our facilities.

cent with being left behind. We must improve the marketing of our importance — it is imperative that we remain "top of mind" with the business leaders of our industry. For they know we are knowledgeable, as well as capable, of addressing important issues that affect the technical segments of the industry.

Consistently, we are initiators, team players and leaders within our own groups. Day to day, we are called upon to assist with critical decisions that not only affect our companies' local operations, but our national corporate operations as well.

From the chief engineer to the director or vice president of engineer-

You can certainly consider the broadcast engineer or engineering department as one of these resources to these decision-makers.

I am proud to be a part of this industry.

My 30-plus years span turntables, tubes and tape from the 1960s to the digital bits of the new millennium. I have seen first-hand the change that broadcast engineering has helped bring about, and I look forward with great anticipation to what continuing trends in technology will bring.

However, it is up to us to stay abreast of those changes and the new waves of technology. Our station decision-makers are relying on us for con-

tinuous input on ways of staying competitive and meeting bottom-line expectations.

Our overall objective will continue to be providing uncompromised public service that is essential to our listeners and viewers in this day and time.

We all are experiencing some amount of uncertainty in today's society, especially following the Sept. 11 attacks on the heart of America.

Commitment

Our industry is strong, will survive and will continue to serve our viewing and listening public in the way we have been doing for decades, but better. Today we need each other more than ever!

It is imperative that we remain committed to this industry and our owners and pledge to give it all we've got. We will be fine, as will America. During this time of heightened uncertainty, it is our industry that will keep our country informed and help it in the healing process.

We will continue to take pride in the profession that we have chosen: broadcast engineering.

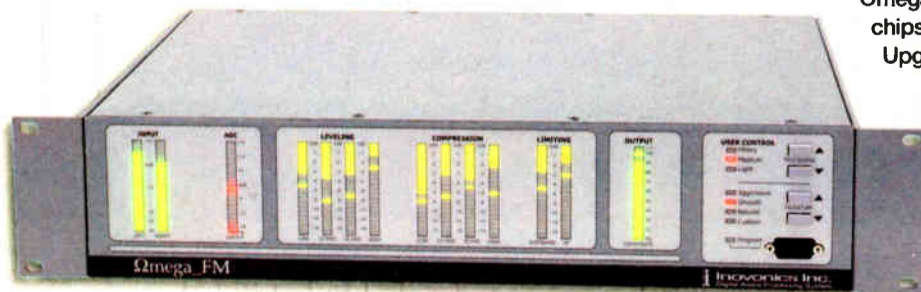
Troy Pennington is chief engineer of Cox stations WZZK(FM), WODL(FM) and WRLR(FM) in Birmingham, Ala. RW welcomes other points of view.

Digitally Different

Omega_FM - \$5880

NEW!

OUR GOAL WAS TO DEVELOP A DIGITAL PROCESSING SYSTEM FOR FM THAT WOULD RIVAL ANYTHING ON THE MARKET. WE MET THAT GOAL...AND THEN SOME.



Omega_FM is a 100%-digital, software-based design. It doesn't use DSP chips or other application-specific parts that rapidly become obsolete. Upgrades don't plug into 'expansion slots,' they're simply uploaded.

Omega_FM is straightforward and uncomplicated. Hardware simplicity keeps the signal path short and your audio clean. Low latency lets you monitor off-air.

Omega_FM is loud, clean and versatile. We don't expect you to take our word for this, and you shouldn't. Schedule a demo at your station through an equipment supplier of your choice.

Inovonics
1305 Fair Ave. • Santa Cruz, CA 95060
TEL: (831) 458-0552 • FAX: (831) 458-0554
www.inovon.com • e-mail: info@inovon.com

Hear It

Processing doesn't get any better than this.



At Ease... with Radio Systems Millenium Consoles

by
**Grady Moates, owner
Loud and Clean**

Boston, MA: I'd have to answer the question, "Why have you installed so many Radio Systems consoles?" with the simple phrase, "I'm lazy!" My goal, as a contract engineer, is to specify and install equipment that addresses all the needs of an on-air or basic production studio efficiently and inexpensively, while minimizing my time spent, both during and after installation. The centerpiece of most of my studio designs is a Radio Systems console.

The Radio Systems RS-12 has been the "easiest to install" console I've ever worked with, and the new Millenium series builds on that reputation with unparalleled control surface reliability.

Planning is a breeze, because you can put any combination of input levels anywhere on the console, and you never have to build an attenuation pad. Never. Microphone level inputs, line level inputs, consumer level inputs and even those pesky "lower than consumer but higher than mic level" inputs can all be intermixed on any fader in the console using only gain jumpers and plug-in headers to set levels. Remote control is equally simple because all basic remote control functions are built into every fader, with sophisticated programming choices just a jumper plug away.

Building renovation is easy to accommodate as well. I've moved complete studios centered around Radio Systems consoles, breaking them down and rebuilding them in another room with all functions restored, in 6 hours. As a matter of fact, I've done it twice in the last 3 months.

Service is another area where I save time with Radio Systems consoles. I've got full access to everything in the console with a swift lift of the hood. The new Millenium series uses

soft-urethane buttons that press conductive pads directly onto gold-plated contacts on the circuit board, with well-designed seals to prevent moisture and dust from contaminating the contact area. Lamps have been replaced with LEDs, which may need to be replaced someday, but I've never had to replace one. Faders, potentiometers and headphone jacks are just about the only interface components that operators can still kill, and they can be replaced in 5 minutes, with the power on, using only an Allen driver and a nut driver. There are Millenium consoles that were installed 3 years ago that I've not had to touch since installation. Install'em and forget'em, that's what I say.

Millenium consoles offer excellent audio quality. From Classical to Rock to Folk to Blues to Oldies to Talk to Foreign Language, the Millenium console does the job clearly, quietly, consistently, and inexpensively.

There's one other reason for specifying Radio Systems consoles, and that's customer satisfaction after installation. It's reassuring to see customers with one Radio Systems console purchasing a second one. Then a third one. Then a fourth one. In a conversation I had just the other day, Rob Landry, the Chief Engineer for WCRB/World Classical Network, who uses four RS-12's and an RS-18 said to me, "I'm ready to build new studios at one of our other stations, and I can't think of a single reason to buy anything other than Radio Systems."

I guess he's lazy too.



Disaster Relief
From now until the end of the year, Radio Systems will donate \$100 for every console sold to the American Liberty Partnership.

radio
SYSTEMS

601 Heron Drive, Bridgeport, New Jersey 08014
(856) 467-8000 voice (856) 467-3044 fax www.radiosystems.com

Finding New Revenue on the FM Band

U.S. Company Seeks Opportunities in Providing Wireless Offerings Via FM Subcarriers; Radio Stations Would Profit

Naina N. Chernoff

As U.S. radio managers know, unused spectrum can translate into extra income for stations willing to lease their FM subcarriers. A Pennsylvania company believes that this market is largely untapped on a global basis and is pursuing it here and abroad.

Clariti Telecommunications International, based in Philadelphia, is deploying a patented digital wireless technology called ClariCast that transmits data using the subcarrier channels of FM stations.

The one-way broadcast service allows operators to provide a wireless voicemail service through a small portable device called the Voca. Users can have telephone calls forwarded to a Voca Player, relieving them from the need to call multiple voicemail boxes to retrieve messages.

The company is demonstrating the product in several countries in Europe and hopes to interest stations with available subcarriers.

Narrow band

"With digital technology today, you can create a very narrow band with absolutely no interference of the main programming," said David Bryan, senior vice president of technical operations at RadioNet Italia, a company jointly owned by Clariti and Pasubio SpA, a financial holding company.

The partnership allowed Clariti to offer its wireless service to the Italian market. Last May, Clariti signed an agreement with the owner of the Radio Radicale network to use the subcarriers of more than 300 radio stations it controls. Pasubio has a stake in the group owner and has invested an estimated \$500,000 in Clariti.

Bryan said RadioNet will establish joint ventures with wireless service providers to operate the ClariCast system.

RadioNet will give the providers the tools and the training to establish a network and help operators obtain the rights to use the subcarriers. Stations that lease their subcarriers will receive a percentage of the revenue for the wireless service.

Last year, also in Italy, Clariti set up a shared revenue agreement with a telecom company to dis-

tribute Voca players. The distributor is using ClariCast to expand its unified messaging services to business users.

For a low monthly fee, customers have access to a full-featured voicemail system and can choose whether to answer calls.

When the Voca player receives voicemail messages, it plays a melody or vibrates to alert the user that a message has arrived. To listen, the user presses the play button, and the voicemail message is played back through the speaker.

Wireless voicemail is not the only use of the ClariCast system. Bryan said RadioNet is fielding inquiries from private highway companies in Europe interested in the technology to provide real-time traffic reports, voicemail and e-mail for drivers.

Advantage

The broadcast technology has a distinct advantage when used to inform drivers about traffic, he said, because one message about traffic congestion could be sent to users in different geographic areas.

The possibility exists for other services, such as wireless newspapers or Web service, he said.

RadioNet plans eventually to offer its services to developing nations as an affordable telecommunications service. Because the voicemail feature is

language-independent and most small towns have at least one FM radio station, the ClariCast system may be a useful communications method.

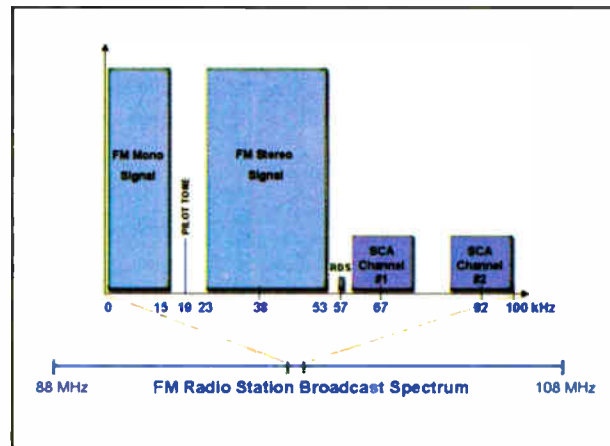
In 2000, the company received a patent from the U.S. government covering "a proprietary method of wirelessly transmitting both digital voice and digital data over the subcarrier frequencies of FM radio stations."

It has had its setbacks; this summer, it received a ruling from Nasdaq that it would be delisted from the exchange's SmallCap market. The company appealed the ruling.

In coming months, Bryan said, Clariti plans to market its services to operators outside of Europe. He estimates that 90 percent or more of FM subcarriers in international markets are completely unused.

Many stations might not realize they can profit from leasing their subcarriers. "In many cases, we

Bryan estimates that 90 percent or more of FM subcarriers in international markets are unused.



The Basic ClariCast System

offer stations money for an asset they did not know they had," Bryan said. "It could be a fairly significant monetary value depending upon the market."

Clariti believes that by using FM radio stations as its wireless infrastructure, operators will have lower infrastructure costs because the transmission equipment already exists at the station.

The only additional infrastructure equipment needed for the system is a central terminal and an SCA encoder.

The SCA encoder plugs into the FM exciter at the station transmission site, providing the necessary interface to allow a digital subcarrier signal to "piggyback" on the main FM signal.

In addition, because the ClariCast system uses a digital technology, it has been optimized to support a large number of users of wireless voicemail over the FM-subcarrier band.

Bryan said RadioNet can also help a service provider deploy its network much more rapidly than other wireless systems, because the antenna tower and transmission equipment are already in place at the FM stations and because of the universality of the band, there is no need to reengineer the system for international markets.

"Digital technology has advanced greatly in recent years and we are bringing to bear all that development," Bryan said. "There has always been a demand for this wireless voicemail and our technology has proven it is viable." 🌐

Custom AM Directional Antenna Phasing And Matching Systems



Four-Tower 50 kW DA-2 Open-Panel And Shelf Phasor
CFRB Radio - Toronto, Ontario

Your No. 1 Source For AM Antenna Systems And Accessories In The USA And Worldwide



Online Shopping Now Available At kintronic.com

Click On LOGIN, Then SHOPPING**

** Prior Approval Required

Kintronic Labs, Inc

Phone: (423) 878-3141 Fax: (423) 878-4224

Product Brochures Available At www.kintronic.com

Aluminum Prefabricated Building with 2 x 30 kW AM Diplexer



WCBS (880 kHz) and WFAN (660 kHz) NYC

Smooth.

Fast.

Easy.

That is what people are saying about the new phone gear from Telos.

Smooth audio, thanks to hybrid enhancements for clear, consistent calls — even cellular phones sound better. ISDN option for pure digital connection to the Telco network.

Fast operation and fewer errors due to the intuitive Status Symbol icons and LCD displays on the new Desktop Directors.

Easy show production, with the Assistant Producer PC software giving you flexible screening and control capabilities over any IP network via the standard Ethernet port.

Telos
www.telos-systems.com

TWO x 12, Status Symbols, Telos and the Telos logo are registered trademarks of TELS Corporation. Copyright 2001, TELS Corp.



DIGITAL AUDIO NETWORK ROUTER

- *BI-DIRECTIONAL FIBEROPTIC OR CAT-5 INTERLOCATION CONNECTIVITY*
- *ALL DIGITAL DOMAIN AES SWITCHING*
- *ANALOG OR DIGITAL (AES SAMPLE RATE) INPUTS*
- *BOTH ANALOG AND AES DIGITAL OUTPUTS*
- *SERIAL CONTROL AND DISPLAY WITH WHEATSTONE CONSOLES*

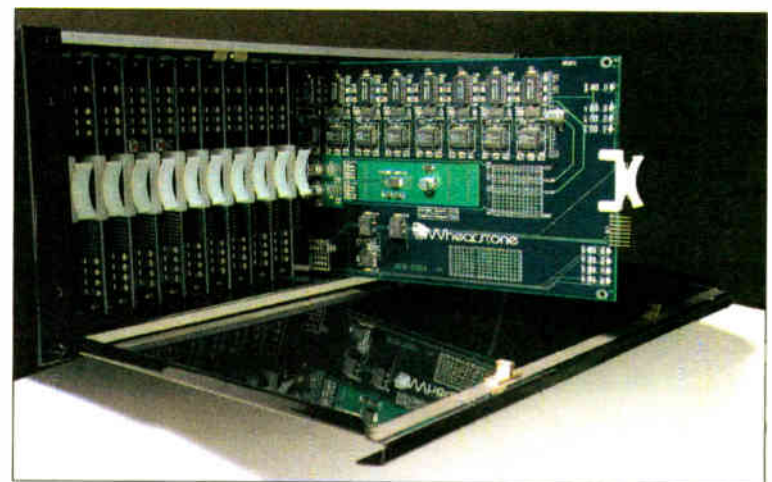
THE 2001 MAKES AUDIO NETWORKING PRACTICAL. It's simple to install, easy to learn, and certain to reduce system costs. Compact enough for small applications, yet stackable for tremendous growth potential, its design consists of 7" rackmount digital routing cages, each capable of handling 512 simultaneous audio channels on its backplane.

Units can be stacked to suit particular card complements (analog or digital input and output cards or optical network cards) but more significantly cages can be separated by great distances and network their audio through either bidirectional fiberoptic links or a single CAT-5 wire. **ONE INTERCONNECT DOES IT ALL:** 64 channels of simultaneous bidirectional digital audio, intercage communication, X-Y controller commands plus auxiliary RS-232 data streams. This single interconnect between your studio and central rackroom can save you tens if not hundreds of thousands of feet of wire in a typical installation.

The 2001's graphic based setup software is intuitive and easy to use, with all the authorization and security levels you could want. And of course we have a full

complement of control panels and PC applications to choose from—all designed for straightforward operation and a rapid learning curve.

With 25 years of experience, Wheatstone has the infrastructure in place to help you build your OWN infrastructure. Contact us for answers.



MIXED SIGNAL SWITCHING is easily accomplished with a choice of AES digital or ANALOG 24-bit A>D input cards, and of course 24-bit digital or 24-bit D>A ANALOG output cards, all of which can be serviced from the front of the cage. All signals are routed entirely in the digital domain.

ROOTS OF RADIO

Continental Is Looking Ahead

Bill Ryan

In the lobby of Continental Electronics in Dallas stands an actual final-stage tube used in one of the early Mexican border-blaster stations. This 8-foot-tall display serves as a reminder of Continental Electronics' heritage in high-power RF engineering and production.

At times in recent years, the company has suffered from some image problems. Its previous owner publicly put it on the sales block. Meanwhile, the company, which has long been known for radio transmission products, quietly abandoned its AM business.

High-power RF

Today, with an ownership change behind them, executives say the company's future is bright.

"We are a major manufacturer of shortwave transmitters in the world, and a major manufacturer of FM transmitters," said George Woodard, Continental's director of engineering. "What we do here is high-power RF."

"And I certainly wouldn't limit us to shortwave and FM," said Bret Brewer, broadcast marketing manager.

Besides the company's emphasis on high-power, Woodard said, "We are tracking the industry, tracking the

development of the two competing standards: Digital Radio Mondiale — the consortium of worldwide manufacturers and broadcasters to convert the AM bands, including medium-wave and the shortwave band, to digital — and Ibiqity IBOC, the U.S.-based attempt to digitize the medium-wave and FM bands, in North America first and the rest of the world eventually."

Continental, like other RF manufacturers in the United States, is obliged to plan for IBOC without knowing for certain what the eventual standard will be.

"But our new designs will accommodate what we understand to date," Brewer said.

Woodard said shortwave is a major part of what Continental does. "We manufacture shortwave transmitters for international broadcasters."

He said the company also builds FM transmitters but is out of the AM transmitter business, acknowledging

that Continental lost its market share in that area.

When Continental, with about 100 employees, was sold, Brewer said, "It was decided that we would back out of the AM business, which had been based on designs of former sub-



Bret Brewer, Connie Hartin and George Woodard

sidiaries Telefunken of Germany and Lensa of Santiago, Chile."

Continental's roots date to the 1930s, when co-founder James Weldon was commissioned to raise the power of XER, a Mexican "border-blaster"

AM station, to 100 kilowatts.

In 1938 he increased the power to 500 kW and the station was re-named XERA. It became the first of a string of super-power Mexican stations.

During World War II, Weldon headed the technical division of the Office of War Information, forerunner of the Voice of America.

Big jobs

In 1946, a year after the war, Weldon joined with Lester Carr to capitalize on the expansion of broadcasting in the United States by organizing Continental Electronics in Dallas.

The company flourished, fulfilling defense contracts for high-power radars and building super-power shortwave transmitters for the VOA.

In the 1970s Weldon took an active role in the design of a 2 megawatt broadcast transmitter for Yugoslavia. This led to super-power transmitters for Egypt, Jordan and Saudi Arabia.

Some of these rank among the largest, most powerful in the world. A current project is the completion of four shortwave transmitters for China, two 500 kW units and two 100 kW.

Another project in the shop, being overseen by principal engineer Connie Hartin, is a timing transmitter for the Japanese government, which will emit precise low-frequency timing signals, similar to the WWV system.

Carr departed early as the company underwent several ownership changes. Weldon retired in 1988 and died five

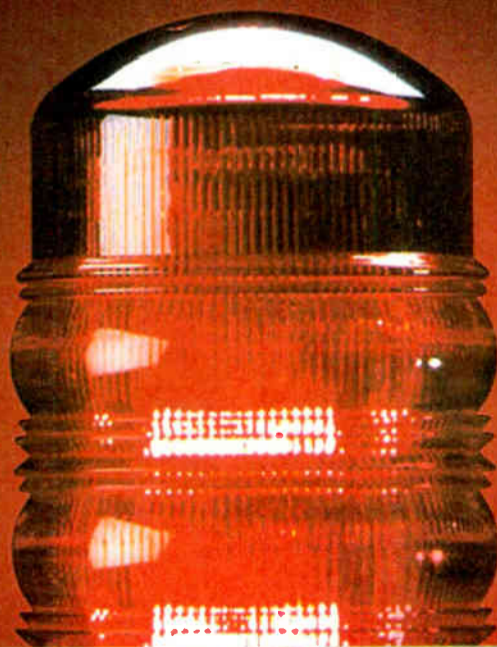
See CONTINENTAL, page 16 ▶

We've changed light bulbs so you don't have to.



LED Based Dual High Intensity System Including LEDGuard L-864 LED Based Beacon.

By using LED technology Honeywell has created a system that will change the way people see obstruction lighting. It's the only LED system that has been approved by the FAA, it uses 90% less energy than comparable incandescent systems, and is guaranteed to last for at least 5 years. So you save time and money. Isn't it time you changed your obstruction light bulbs? For more information, call 1-805-581-5591.



Honeywell

THE UNLIMITED PARTNERSHIP

Sidelobes, Multipath and You

Richard J. Fry

How can you get the most out of your FM antenna system?

Radio World asked three prominent broadcast consulting firms to respond to a number of topics about FM antenna performance. Last issue, we printed their answers to the first two questions. Their replies continue below. More will follow in future issues.

The participants are Ben Dawson of Hatfield & Dawson; Bob Culver of Lohnes & Culver; and Don Markley of D.L. Markley & Associates.

Note that any consultant would need specific site and application information to provide an accurate recommendation for a given situation.

Topic: Impact of antenna sidelobes on multipath performance in the area served by the main lobe of the antenna:

Dawson: Reduction of sidelobes, or even shoulders of the main lobe in the case of antennas with a small number of bays, can substantially reduce foreground reflections, which create multipath, particularly in some environments with high ground reflectivity.

Culver: Multipath reception problems are not caused by the transmitter antenna. They are caused by reflections of the signal anywhere along the propagation path, most likely at intermediate points or closer to the receivers than to the transmission antennas.

But if there are unusual conditions near the transmitter antenna, be aware of them and be prepared to minimize their impact.

For example, if you seek a transmitter site in the mountains and will be below or "in front of" a ridge, you should seek to not send a strong signal into that ridge. If you do, you will build in a permanent and stable signal propagation delay.

It will create some pattern scalloping depending on the strength and phase of the reflected signal. Beside, there will be very poor service beyond the ridge and I hope there is no important population there. If there is, you have the wrong transmitter site.

Similarly, if the transmitter antenna is on a short pole on top of a ridge and a strong side lobe is directed toward the ground nearby and reflected into the service area, the same problem arises. Look for an antenna with reduced side lobes or a taller pole.

In summary, there is very little one can do to correct "multipath" from the transmission end. But you can and should take a careful look at the proposed transmitter site to make sure you are not building a problem into the system.

I have had some anecdotal information that 1/2-wavelength antennas perform quite well. But you must be ready to pay the extra antenna cost, wind load, transmitter power and ERP trade-offs.

Markley: The impact of side lobes on multipath seems to be the *fad du jour*. We really haven't seen any proof that this makes a big difference.

Topic: Effects of tower face width, orientation and guys on the pattern performance of a side-mount antenna:

Dawson: Side-mounted antennas should never be used without manufacturer's measurements of the effects of the specific tower and mounting.

Culver: Everything in or near the antenna aperture will affect the resulting pattern, both the vertical and horizontal plane (horizontal mostly) and both polarizations (vertical mostly).

tionality (some, like panels, are highly directional and an omni horizontal pattern is achieved only by the array around the tower axis). Adding the feed line makes it worse. Adding the mounting pole, worse yet. Mounting it on a tower, at what distance and orientation and you get the idea. The resulting pattern can get really bad.

I had dozen or so illustrations of this. The pattern null ranged from about 2 dB to well over 15 dB, the maxima were from a small fraction of 1 dB to over 3 dB.

There is little one can do to correct 'multipath' from the transmission end. But take a look at the proposed site to make sure you are not building a problem into the system.

— Bob Culver

I did a paper once regarding the "native" patterns or non-directional antennas. That was at the time of the promulgation of the 73.215 contour protection rules.

The element itself has a slight direc-

If you just slap the antenna up, you will not know what you have. You can try to calculate the resulting pattern, but it is tough. You can measure the pattern much more easily, but only in the horizontal plane where a one- or

two-bay model is available.

The entire antenna and a longer section of the tower are needed to investigate vertical pattern effects, but they should not be too pronounced because the vertical tower is much larger than the antenna and represents essentially an infinite length reflector in the vertical plane.

Horizontal polarization is affected by the horizontal components of the tower, which can be quite small or can be at a critical dimension and have a serious impact. The vertical structure is always large and affects the vertical polarization in a more uniform way.

Both polarizations are affected by the distance the antenna is mounted from the tower.

Markley: If the most non-directional operation possible is desired, a pole or narrow-face tower is needed, 18 or 24 inches at most.

A tower with a face width of 42 to 48 inches causes terrible pattern distortion. The cross bracing of the tower is approximately 1/2 wavelength long and seem to contribute to significant pattern distortion.

Larger towers, 10 or 12 feet in width, create strange patterns with multiple lobes and nulls that may require some work to make usable.

Richard Fry is a retired FM applications engineer with almost 35 years of service with major U.S. broadcast transmitter and antenna manufacturers. Reach him via e-mail to rfry@adams.net.

Continental

► Continued from page 15 years later at age 88.

Current managers take pride in the defense contracts they are fulfilling, along with transmitter contracts for commercial and government broadcasters around the world.

Woodard — himself a former vice president of engineering at Radio Free Europe/Radio Liberty and senior executive with the International Broadcasting Bureau — said that Continental's heavy involvement in highly specialized high-power RF systems for worldwide buyers "had diverted our attention from our broadcast markets."

R&D

Asked why the company has continued to shy away from solid-state transmitters and use vacuum tubes, Brewer said, "We were heavily diverted in our engineering efforts when HDTV came along, designing and building television transmitters. We had not been in the TV business and focused all of our R&D into getting into that business. We developed that, introduced it to the market and then sold that division."

While that was going on, the company was for sale, and the owners did not want to "drop a bunch of money into something (research) prior to being sold," Brewer said.

Continental now is a division of privately-owned Metric Systems of Florida, one of a group of companies owned by Integrated Defense Technologies. Woodard said the plant's products are 30 to 40 percent commercial. The balance is military and other specialized projects for the scientific community.

"Under the new ownership, we are focusing on new R&D projects, including AM, solid-state FM, the new digital exciter and other items," Brewer said. "My responsibility is to turn around the AM and FM domestic broadcast division, and I will be addressing every product and build a business plan around it."

terms of cost, reliability and performance, and it will remain so for another many years."

Woodard is confident that Continental, with its many sources of income, will be around in the future.

"We want to build our commercial broadcasting arm back to where it once was, where it's a fully functional,



The Continental Plant in Dallas

"If the product will support a business plan, we'll be in that business. If it won't, we won't. If I can't financially build a stable plan around the AM part of the business, then we won't do that."

Woodard said, "We believe our 816R Series FM tube transmitter is still the best transmitter on the market at the power level at which it is sold in

very broad product line, 40 or 50 percent of the company value."

Brewer said, "I get upset by (those) who wonder if we're going to be in business in the future. Well, the Navy trusts us, and I guarantee you they come in and investigate us thoroughly before they place a multimillion dollar order with us, and it's a several-year program. So we'll be here."

"The best choice"

Ron and Beth Fruit of WRCO wrote us a letter about BSI's digital automation

October 9, 2001

Dear BSI,

When WRCO Radio made the decision to go digital, our choice was BSI. I was really impressed and still am with your "try it before you buy it" philosophy. I became familiar with the software in the demonstration mode and was convinced it was the best choice for us before I ever wrote the check. After purchase, we were up and running in no time at all. I think it is clear that the BSI team has a strong grasp on what broadcasters want and need. I also appreciate the BSI philosophy that allows so much flexibility in hardware, although I have learned that following BSI recommendations is a very very good idea!

When we announced the change to digital at WRCO, several staff members were skeptical. Today, the comment often is, "how did we ever get along before?" or "I sure wish we would have done this even sooner."

We really appreciate the flexibility of BSI digital automation products. Our FM is live assist while the AM carries a satellite format. BSI products handle both tasks very well. When our farm network started offering mp3 downloads, we were able to route the material across our network and take full advantage of the opportunity in every studio, thanks to BSI. Similarly, as we have implemented change here at WRCO, BSI products have easily made the change with us. With BSI, I feel like I control the station and the software, not the other way around.

From the production studio to the control room, I can't imagine why we would ever want anything but BSI. It's reliable, user friendly software with the flexibility and power to make it a great investment.

Ron and Beth Fruit
WRCO AM & FM Radio
Richland Center, Wisconsin



Only \$1499
including technical
support and upgrades

Price, Power and Performance

More than 5000 broadcasters use our software in more than 50 nations around the world. Our \$1499 Simian includes one year of 365/24/7 tech support and software upgrades. Simian has amazing features, such as streaming spot substitution, automated online requests and touchscreen compatibility. Runs on Windows 98, NT, 2000, ME and XP.



Test and try before you buy.

www.bsiusa.com

888-bsiusa1

**Broadcast
Software
International**

If You Feel Like This



You Need This

Looks like you've got your hands full again. Except you're running out of hands. And because you have many facilities you could use a few more legs, too.

Let Harris' Intraplex STL PLUS™ give you a hand getting your new station up and running quickly and profitably or upgrading your station to the best quality digital on-air sound available today.

STL PLUS™ gives you bi-directional program audio transport over a T1 line, fiber or microwave link. So you can interconnect your studios, offices and transmitter sites. And because it's a digital system, you're delivering pure, crystal clear sound – regardless of the distance. Even if you're surrounded by the highest mountains or tallest buildings.

Now for the PLUS in STL PLUS™: You can also transmit LAN/WAN data, telephone, intercom, and remote control over the same digital line. All of which can rack up some pretty impressive cost savings for your inter-facility communications.

Best of all, STL PLUS™ grows with you as no one else can. It has the industry's largest assortment of plug-in modules. So you can design the perfect system for today and quickly, easily, and affordably upgrade it for tomorrow.

So, contact your Harris representative about STL PLUS™ today. You'll be a leg up on the rest.



next level solutions

SERVICE

SYSTEMS

AUTOMATION

TRANSMISSION

Workbench

Radio World, December 5, 2001

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

Nice Things for the Staff and You

John Bisset

Figure 1 begs the question, "Will lightning run backward?" It's always a good idea to add a cable ground kit, as shown in the photo, but the best pro-

tection occurs when the ground wire is not looped and runs straight to the ground strap. The second coax belongs to a tenant, and it was their choice not to ground it. I'm not sure I would want ungrounded line entering the transmitter building.

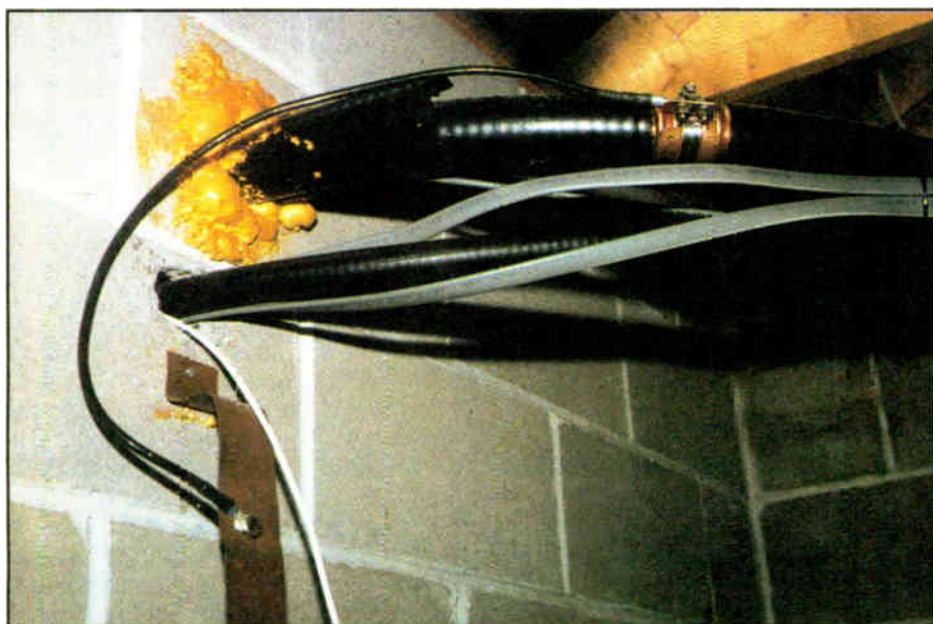


Fig. 1: The station took several smart steps to prepare this cable entry.

This point should be added to any tower lease: lines will be installed and grounded as recommended by the coax manufacturer.

I'm a big proponent of sealing your building, and you can imagine that this station got high points by plugging the

Should the line ever need to be replaced, the cable will slip in and out easily. If you've ever worked with this expanding foam, you know it's sturdy stuff. So save yourself the headache and use some kind of sheath to make removal easier.

★ ★ ★

In this holiday season, thoughts of doing something nice for the staff may come to mind. After all, keeping your staff happy definitely is part of the politics of running the technical side

of a radio station!

Tim Parker with Bonneville's WWZZ(FM) in Washington added a wall panel switch to control the station's overhead speakers. In the Z's case, the speakers can be set to monitor the station audio and break away for paging (labeled "Page/The Z"), or selected for "Page Only," should a quieter environment be required.

This is a good job for your assistant, and it's an ideal solution for conference rooms or lunchrooms. Another approach is to provide a multi-position selector switch, so that any station in a cluster can be fed through the PA system.

I won't go into the elaborate system one GM wanted, in which the music-on-hold was switched from the easy-listening station in the morning and afternoon hours on Monday, Wednesday and Friday to the country station in the middle of the

day. On Tuesday and Thursday, the rock station played all day.

We were ready build the circuit, but I think the price scared him away.

★ ★ ★

While we're talking about doing nice things, how about something nice for yourself?

I'm talking about security panels, like the ones shown in Figure 2. The hinged panel permits quick access, but provides a nice seal to keep eager fingers out.

Middle Atlantic and Orban provide security panels. Contact your distributor for more information or head to the Web sites.

★ ★ ★

How is your tower grounding these days? If you've taken over a new site and find clamped grounds, consider remaking the connection with

See WORKBENCH, page 20 ►



Fig. 2: Hinged security panels can keep twiddlers away.

RDL® RAISES THE BAR FOR DIGITAL PERFORMANCE

SOURCE SELECTION (2 models to choose from)

- AES/EBU
- SPDIF

DISTRIBUTION (2 models to choose from)

- AES/EBU
- SPDIF

CONVERSION (4 models to choose from)

- 2-digital to analog
- 2-format



RU-UDC1



SURE-LOK™ Auto-Recovery Sentinel means the BEST choice for production, the ONLY choice for broadcast.

There is never a need to manually restart RDL digital products to resynchronize: IT'S ALL AUTOMATIC!

And SURE-LOK is exclusive to digital products from Radio Design Labs®.

All models: up to 24 bit, 96 kHz capable. In professional applications, anything less is unacceptable.

For a complete listing of our products, call or write: (800) 281-2683 • (805) 884-5415 • email: sales@rdlnet.com • website: www.rdlnet.com



In Spain, Saying Goodbye to Analog

Raúl Llarull

Spanish public-service broadcaster RNE is in the midst of a technological remodeling process that will result in digital operations.

Tapes and other types of traditional media will pass into history.

Although Radio Nacional de España is far from the first station to undertake such a changeover, several factors make its experience unique. But the technical choices underlying the project would be familiar to the managers of any large U.S. radio facility.

National group

RNE is part of the RTVE group, which oversees national public-service broadcasting in Spain. Its national services — Radio 1, Radio 3, Radio Clásica and Radio 5 — plus the Radio Exterior de España (REE) originate from the Casa de la Radio, or Radio House, in Madrid.

Central to the programming of Radio 1 are its information services, which feed the other RNE services.

The daily Radio 1 service consists of 24 hourly bulletins, four long-form segments and special programs. These supplement the all-news Radio 5 format

and the music-formatted Radio Clásica and Radio 3.

In 1997, RNE technical managers initiated the process of digitizing the broadcaster.

"We are embarking on three convergent processes that develop simultaneously: digitized production of programs and bulletins, the digitization of the audio archives and digital radio broadcasting," said RNE Technical Director José María Huerta Crisólogo.

Over the past four years, RNE has completed the digitization of its central studios, and digital program production has been in use since 1999.

In addition, RNE has begun the digitization of its 17 regional centers, which will be complete in 2002, interconnecting its 63 regional production centers.

At the same time, in 1999, RNE began digitizing its audio archives, a task that will be complete by year-end 2002. Finally, it began broadcasting in DAB in 2000.

RNE is using the AEQ MAR4Win digital management system. Managers said they chose it for its modular, scalable design and diverse computer applications that could be adapted to a variety of user needs.

AEQ, based in a suburb of Madrid,

offered the benefit of technical support in Spain.

"This is a job in which immediate attention to the needs of the client is very important, because our technical issues almost always demand quick responses," Huerta said.

The MAR4Win system at RNE includes modules that handle broadcast management, audio editing and text processing; record eight channels of audio in ISO/MPEG Layer II at 64 kbps; create visual or numeric frames above the recording entries; handle feeds from 10 news agencies; allow quick viewing of broadcast lists and program texts; process internal e-mail; and record some 300 logs sent by system managers at the RNE regional centers.

In 1998, 30 digital workstations were installed at the Casa de la Radio. Additions to the system have raised that number to 275 workstations, with more to come.

By 2001, the system was being installed in the regional centers, as well as at local stations and outside correspondents, adding some 300 more workstations.

When complete, the system will interconnect the RNE production centers, allowing them to share audio information, text and news across the system.

User-training programs have been developed and implemented concurrent to the installation of the workstations.

As the MAR4Win system was installed across RNE, the broadcaster set about to digitize its historical archive in a single format.

Digitizing the archives will put RNE historical programs at the disposal of journalists, creating near-instant access to the audio and associated documentation and metadata.

This is a monumental task; the RNE audio archive is equivalent to 26 years of continuous sound, more than 230,000 hours of music and commentary. It grows by approximately 10,000 hours each year.

The archives are stored in a facility that houses 22,634 cassette hours, 64,458 hours of reel tape, 47,085 hours of CD, 38,353 hours of vinyl disc and 10,379 DAT hours.

All in all, more than 1.3 million sound registers are stored on more than 800,000 pieces of media.

Digitization of the archives is expected to be completed by the end of 2002. To meet this goal, 25 digitization teams will process about 240 hours of audio every day.

In addition to the audio itself, some 240,000 documents associated with the audio must be added to the archive.

To handle the task, an IBM RS/G500 server was selected to manage the digital archives, which will be hosted on a robotized tape library with 1,270 cells and 20 GB tapes. The total storage capacity of the system is 25 TB, equivalent to 242,570 hours of ISO/MPEG Layer II compressed audio.

The goal of all this digitization is the increased use of various forms of digital audio broadcasting.

RNE has been one of the pioneers of DAB development in Spain. A royal decree in 1999 approved a national technical plan for terrestrial DAB,



reserving six program slots for RTVE: four slots within the national single frequency network without regional optouts and two programs on one of the national multifrequency networks with regional optouts.

RNE covers about half of the Spanish population with DAB signals. It hopes to extend coverage to 80 percent of the population by early 2004.

Satellite, Internet

RNE also is carried via the Hispasat, Asiasat, Telstar-7 and NSS803 satellites, and transmission via Eutelsat will be added.

Programming also is carried on the WorldSpace AfriStar satellite, broadcasting to Africa and the Middle East.

While RNE is pushing ahead with many new transmission media, its technical directors are moving cautiously in regards to how it uses the Internet.

"We believe we should study experiences — our own and those of other broadcasters — before deciding on a policy in that sense," said Huerta. "We are broadcasting REE through the RTVE Web page and it is proving to be useful."

Huerta said RNE considers the Internet an "important platform for radio broadcasting," as well as a good means to increase documentation.

"For the moment, it is a tool for us to offer audio in real time and on demand, what we would call 'radio à la carte,'" he said. "We are not convinced, however, that it is worth the trouble to send out all of our broadcasts via the Internet, even though we are experimenting with some of our more well-known programs, webcasting them and allowing listeners to interact via chat rooms and electronic mail."

Overall, preparing RNE for all-digital operations is a monumental task because of the volume of information to be managed, the number of personnel involved and the combination of processes.

"It has been and still is a project of great importance: We have been able to improve the production processes, reduce operation costs, share information among all users, improve content quality and interconnect all our production centers within the system," said Huerta, "all with the full acceptance of our professional staff, who have adapted exceptionally well to the new working conditions of a totally digital environment." ●

Workbench

► Continued from page 19

Cadwelding.

Erico Inc., which developed this trademarked exothermic welding process in 1938, makes a one-shot Cadweld system, sold at electric supply stores. The system is priced reasonably so you can get the benefits

horizontal run from the building to the tower was constructed using white water-pipe fittings.

Michael also found an unusual fitting on the base of the lowest junction box, a foot-long stub with a threaded coupling. Screwed onto the coupling is a garden-hose connector with a screen over the opening. A condensation drain, and as pointed out by Tom Osenkowsky, CPBE from

Perhaps one of the most frustrating and costly tower ventures is replacing tower light wiring on older structures.

of Cadwelding at a price that won't break the bank and without a lot of expensive equipment.

★ ★ ★

Perhaps one of the most frustrating and costly tower ventures is replacing tower light wiring on older structures.

Michael Barnes, engineer at the World Radio Network in McAllen, Texas, encountered chafed wires inside the conduit going up the tower, most likely due to years of vibration in the wind.

Conduit joints also were loose, and in some cases, the wind would flex the tower to the point that you can hear some serious sparking inside the conduit. You know what happens next: the breaker trips. To make matters worse, the 50-foot hor-

New England, a feature necessary over long runs of conduit.

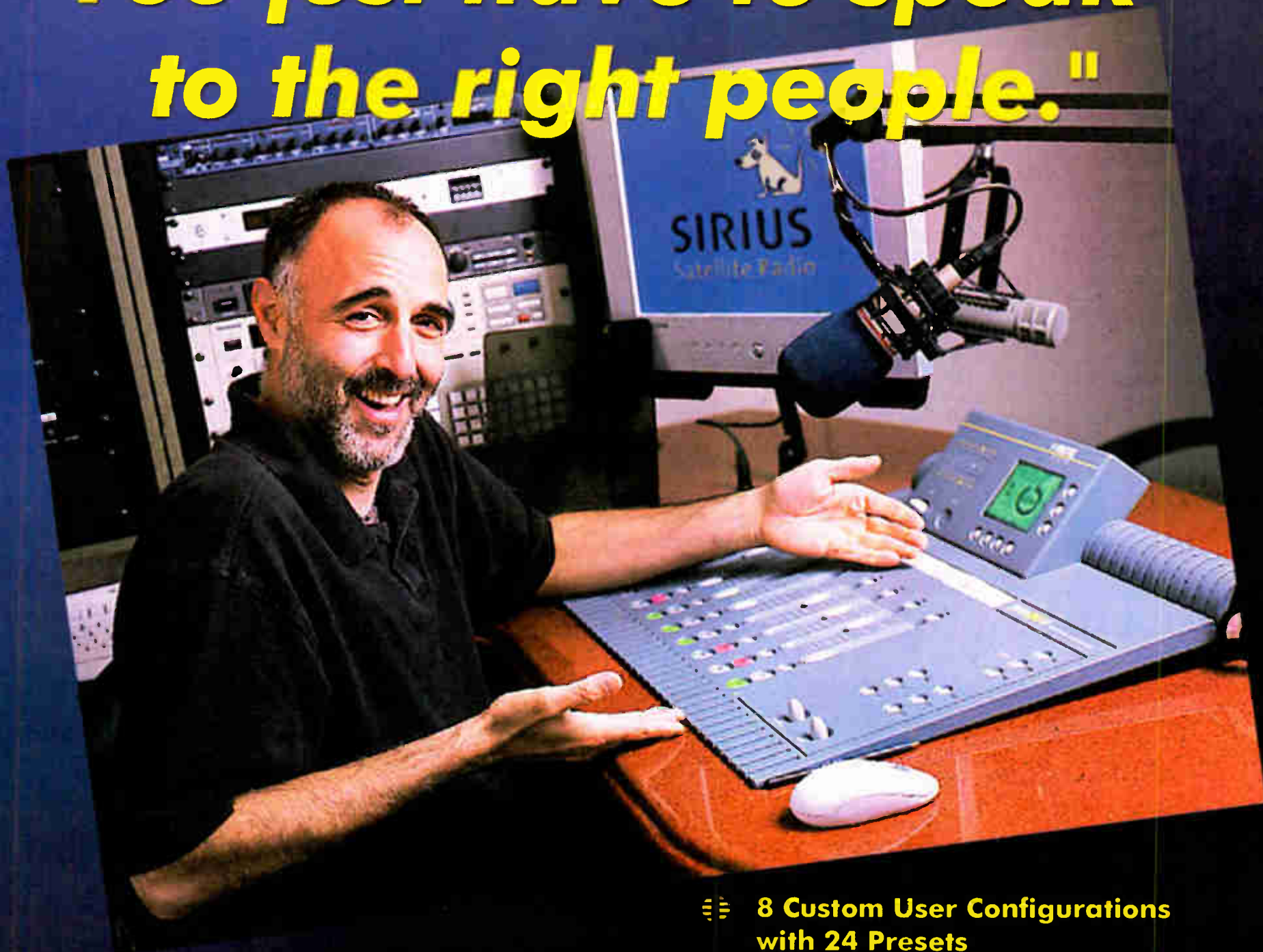
Keep in mind that the temperature inside the conduit can vary considerably over the 1,000-foot length of the run. No drainage? The worst-case scenario, flooded conduit, could be the result.

Faced with aging tower light wiring? See if you can extinguish the lights. Especially in the case of multi-tower AM DAs, you may be able to get a waiver to extinguish some or all of the lights.

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. ●

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



≡≡ Instant "Production to Air" Change-Over

≡≡ Custom Voice Processing, Dynamics, and EQ

≡≡ 8 Custom User Configurations with 24 Presets

≡≡ Protected, Intuitive Menu Structure

≡≡ Intercom Auto-Sense I/O and Signal Loss Notification

"This board is an 11! Even though the faders only go to 10..." *Lenny Bloch, Program Manager, Sirius Satellite Radio*

KLOTZ DIGITAL's Paradigm sets the new digital audio standard for radio on-air consoles. Easily integrated into your existing control room/facility, this compact and durable 24 input console boasts more features than any other in its price range! Expandable to 48 inputs, the Paradigm digital console provides operators with a standard and intuitive control surface and offers the ultimate in flexibility and digital audio quality. That's why the most sophisticated and technologically advanced facilities throughout the world choose KLOTZ DIGITAL.



DIGITAL

5875 Peachtree Industrial Blvd.
Bldg. 340

Norcross, GA 30092

Phone: 678-966-9900

Fax: 678-966-9903

www.klotzdigital.com



PRODUCT EVALUATION

The 'Broadcast School in a Box'

Eric Shoars

Every air personality has a story about how he or she got that first gig. No matter how much the radio industry has changed over the decades, the urge to tell a story of your first radio job is a constant.

The thing that has changed is how people get that first break.

Some people, like myself, got their first radio job without having gone to broadcast school first. Others went a more "traditional" route and went to broadcast school/college and entered the industry upon graduation.

There is now another option that future radio personalities have in making that first step into the world of radio: "Broadcast School in a Box."

How-to

This is the brainchild of Marc Elliot Hochman, who works in sales at a radio station in Florida. He declined to name the station, saying only that it is owned by one of the major broadcast groups.

'There has been a ton of skepticism from the industry,' Hochman said, but response elsewhere has been better.

The video is a 90-minute instructional about how to become an air personality or sportscaster. It provides tips from radio professionals including air talent, sportscasters, traffic reporters and program directors on how to get that first radio job. It provides a step-by-step tutorial on creating an air check tape and includes instruction on how to enhance your voice.

But can someone receive the information necessary to enter the radio industry in just 90 minutes and expect to earn an air position at a radio station?

"The purpose of the video is to act as a primer course for radio for those individuals who have an interest in getting into the industry," Hochman said.

"The video gives people an affordable way to get an introduction into radio. After watching this video, people will have a better idea about whether or not they want to get into radio."

Hochman believes traditional broadcasting schools and colleges are not preparing people fully for what they will experience in the day-to-day operations of the industry.

"There are a lot of radio stations out there, but not a lot of schools," Hochman said. "If a person,

whether they are just out of high school or looking for a new career, wants to go to broadcast school or college, he or she is looking at spending a lot of time and money and may have to move in order to attend school.

"Why go to all of that trouble and then find that radio isn't for you? The video gives people the opportunity and information they need in order to make that choice. I'm trying to fill a void, to serve an underserved population."

Hochman, a former instructor at the Connecticut School of Broadcasting in North Palm Beach, Fla., attended the University of Miami and landed a job at the college's radio station, WVUM(FM), in his freshman year.

Later he became the station's underwriting director and its program director. After he graduated in 1991, Hochman did a summer internship at WBBM(FM) in Chicago.

"I asked everyone within earshot at B96 about radio. I wanted to learn about radio, about how

they got where they are."

Hochman has used this "ask-everyone-within-earshot" philosophy as the foundation to his program.

"When I started choosing the material for the video, I wanted to get a cross-section of air personalities in a variety of markets to say, 'Here's how I did it.' I wanted to show people all of the different jobs, the opportunities there are in radio and provide information about each and show people how to take that first step," he said.

Response has not been universally positive by any means.

Primer

"There has been a ton of skepticism from the industry," Hochman admits.

That's understandable, I think. Radio is not learned merely by watching or reading but by performing. To make a claim that one could learn to be an on-air personality from a video would be like saying you could watch a training video on how to be a professional baseball player and then getting a position on a major-league baseball team.

Hochman doesn't necessarily disagree, but states that the video was not meant to be a "be-all end-

all" trainer for the industry but rather a primer for it.

"When I talk to industry people about 'Broadcast School in a Box,' I preface it by saying if people can afford broadcast school, they'll get a thousand times more experience."

Hands-on

"People obviously need the hands-on radio skills in addition to the information they get on the video. You can't learn everything you'll need to know about radio in 90 minutes. Again, the video is meant to be a primer to the radio business."

Response from outside radio has been better.

"It's been tremendous," Hochman stated. "I receive about five to 10 e-mails a week about the video. We've sold tapes in the hundreds across the country and to places such as the United Arab Emirates, the Dominican Republic and Bahrain."

Many users, especially in other countries, don't have easy access to broadcast schools, he said. The video gives them a tool to make the choice about whether radio is for them.

Hochman has received some success letters from individuals who have purchased the video and have started a career in radio, and says he has received no complaints.

"I have been pleased with the sales of the video, especially since we haven't done a lot of marketing. We have the Web site where people can order the video, but mainly we have distributors who sell it to schools and retailers."

How does the tape prepare hopefuls for radio's consolidated landscape?

"The video really doesn't prepare people for consolidation," said Hochman. "Whether it is good or bad, (consolidation) is a reality and people need to realize that. Consolidation doesn't change the fact that you need talent and to work hard to succeed in radio. You need to continue working on your skills to be good."

"There are fewer options out there if you're not as good as the rest. I think consolidation has raised the talent level of the industry ... the cream rises to the top. If you're really good, you could rise through the ranks."

After viewing "Broadcast School in a Box," I can see its value to radio hopefuls. It provides an inside look at radio from the point of view of on-air personalities and program directors, as well as Hochman himself. I now show it to my students in my radio classes to give them a look at the industry they are seeking to enter.

The video features tales of the industry from people working in the industry and each gives his or her advice on what it takes to be successful in this business. Tips from program directors regarding

job-seeking are helpful.

There is a section of the tape on compilation of an audition tape and a scoped five-minute air check as an example. The audition tape can be difficult for students to

Because students are actually assisting radio staff and learning in a hands-on situation, they are becoming that 'known quantity with experience' who are in the ideal position to go on-the-air at their station."

Petulla agrees with Hochman about the failure of colleges and broadcasting schools to train future radio professionals adequately.

grasp. This portion of the video makes the process of making a tape easy to understand.

The only section of the video at which I scoffed was the vocal instruction. Yes, proper vocal techniques are important, but I am skeptical that someone could be instructed on this topic in five minutes through a video.

Hochman described "Broadcast School in a Box" as a primer, and I agree. However, it's no replacement for practical, hands-on experience — the best teacher for radio hopefuls.

Hochman has teamed with Radio Connection in an effort to provide that hands-on experience.

Jimi Petulla, president of Radio Connection, describes his service as a direct connection between people looking to break into the radio business and radio stations looking to hire new talent.

"We select and hire successful radio program directors to be both counselor and mentor to our students, providing guidance throughout our training course. The director also monitors all scheduled training sessions at the station.

"Colleges and broadcasting trade schools provide an education, not experience. There is no way for these schools to re-create the dynamics of the real commercial radio station.

"Our trainees learn the real world of broadcasting by working with professionals who announce to thousands of listeners everyday. Therefore they not only receive training, but also develop a background of proven job experience as well as industry references. The combination of all three look great on a résumé."

Now that "Broadcast School in a Box" is partnering with an organization through which actual on-air experience can be obtained, it remains to be seen if the primer will become the actual broadcast school he envisions.

"Broadcast School in a Box" is available on video and CD-ROM. You can get a free copy by calling the number listed below.

For more information visit www.broadcastschool.com or call (800) 295-4433. Information also is available through www.radioconnection.com.



MARKET WATCH

Sioux Falls Succeeds in Isolation

Bob Keyes

For decades, radio in Sioux Falls, S.D., was mainstream and mostly predictable: church services on Sunday morning, country music across the dial and a steady dose of golden oldies.

All that changed in the mid-1990s. With deregulation came the emergence of two major radio groups in Sioux Falls, giving them control of 11 of the city's 15 commercial stations.

Isolated

Those operators — Southern Minnesota Broadcasting, known locally as Results Radio Inc., with six stations, and Midcontinent Media with five — began to experiment with programming. The companies introduced new formats that targeted specific audiences and segments of advertisers.

For the most part, the experiment has worked. While some listeners grumble that station managers have grown increasingly dependent on satellite-fed programs, the radio business is good in Sioux Falls, fueled by an expanding economy that is largely insulated from recession.

Stations in this market generate \$11.5 million annually, according to



The Sioux Falls are not only a part of the city's name, but also a feature of the metro area near downtown.

the BIA Financial Network. And even in this soft economy, Sioux Falls is confident.

"We're hanging in there," said Curt Dykstra, sales manager for Midcontinent Media's Sioux Falls cluster. "It's not a banner year this year, but we're still doing really, really well. Sioux Falls is still growing and the economy here is still strong. We won't see the gains we've seen in the last few years, but we're well-off."

Sioux Falls is a growing city, with a 24-percent increase in population since 1990, to 124,000 people, according to the U. S. Census Bureau.

It also is a regional medical center, with five hospitals. Sioux Valley Hospital is the top employer in the market, with Citibank's credit card processing center second. Sioux Falls has as many as 10 credit card processing companies, according to the city's Development Foundation, which boasts that the cost of doing business in Sioux Falls is the lowest in the country.

Deregulation made it possible for this conservative Midwestern city to make room on the ever-expanding dial for the likes of national heavyweights Don Imus and Dan Patrick, while giving local on-air personalities more creative latitude.

Morning drive these days sounds a lot more metro, if not as local, than it used to. To be sure, you can still call Midcontinent's KELO(AM) to wish Aunt Mildred a happy birthday, but gone are the days of on-air funeral reports and lunch menus.

While Results and Midcontinent set the tone and advertising rates, maverick businessman and locally grown radio veteran Lee Axdahl continues to chip away at their across-the-board domination. Since 1997, shortly after he sold country station KTWB(FM) to Midcontinent, Axdahl and his company, LA Media, have put three stations

on the air: country KKHG(FM), adult standards KSQB(AM) and oldies KSQB(FM).

Axdahl, who got his start at KAUR(FM) in the 1970s, may not be done. He said he's eyeing the one high-power frequency that's still available in the market, but isn't prepared to discuss his company's long-term plans.

A big change in the local market is yet to come: Arbitron's fall 2001 survey, scheduled for release in February, will be the last in the market — for now. Arbitron's vice president of Communications Thom Mocarsky confirmed that the agency plans to discontinue "surveying" Sioux Falls, because of a lack of support among the current ownership groups, he said.

At present, Midcontinent Media is the sole group that purchases the Arbitron survey.

Citing monthly savings of \$4,000, LA Media recently opted not to purchase

See MARKETWATCH, page 24 ▶

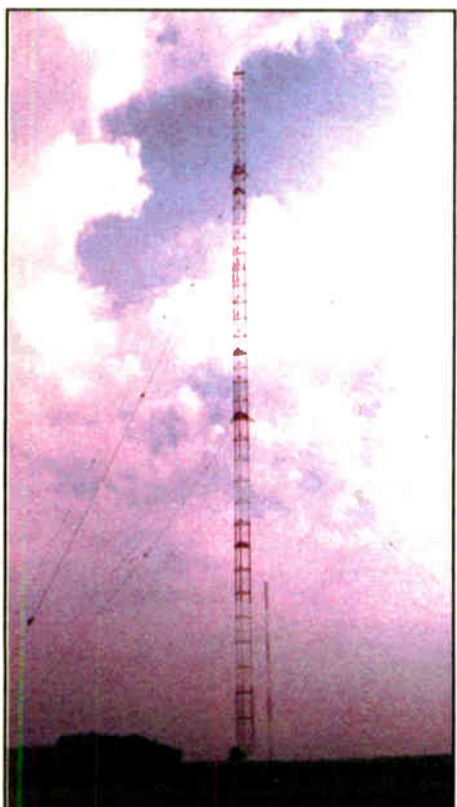


Photo by Scott Fyebush

At 927 feet, WNAX's tower was America's tallest when built during World War II, and remains its tallest AM tower. Thanks to ground conductivity and WNAX's low spot on the dial, the 5-kW signal reaches most of the Dakotas, Nebraska, Iowa and Minnesota. Two shorter towers are used to create a night pattern that protects stations in Texas and elsewhere.

It's All About Personality.

So check this out —

Makin' Radio More Fun Instant Replay® puts 1,000 of your favorite noises right in front of you, ready for instant playback. No other audio player makes it so easy to be spontaneous and creative. It's fast, it's easy, and it's fun. Here's the deal. One Instant Replay can store over 24 hours of stereo sound. That's 24 hours of sound effects, spots, promos, even entire songs — anything — and you can play any of them back instantly by pressing one of 50 Hot Keys! There's no need for training. It's self-contained and works right out of the box — just push the buttons and go!



Now with Editing!

Log on
360systems.com

Get
the
Story

Phone (818) 991-0360
Fax (818) 991-1360

360 Systems

Marketwatch

► Continued from page 23

Arbitron's services, making it difficult for the research company to justify continuing the twice-a-year survey.

Axdahl said he doesn't need Arbitron data to sell his station; he needs better sales staff.

"Most stations have sales reps that 'paint by numbers.' We're training van Goghs."

To achieve this vision, Axdahl said he has used the money he was paying Arbitron to send his sales staff to Roy Williams' "Wizard Academy."

"It isn't cheap, but it is worth every penny," said Axdahl.

Axdahl puts one of the Radio Advertising Bureau most repeated edicts into practice: He trains his staff to "educate" the advertisers, to help them understand radio's effectiveness.

"I bought 1,000 copies of Roy Williams' 'Secret Formulas of the Wizard of Ads.' We give each of our clients a copy to help them understand what makes a great ad," Axdahl said.

Arbitron's decision to drop Sioux Falls has been met with indifference by the city's other broadcasters.

No ratings — no problem

Don Jacobs, general manager of three of the six Results Radio stations in Sioux Falls, with oversight over the cluster, long ago stopped buying the survey because of what he considers statistical quirks. He first soured on the survey when he worked in sales at a local rock station two decades ago.

"It was a hot station, the station to listen to. Well, we had a real bad book one year. The next book came around and we had huge numbers again — it bounced right back. And I wondered, how could it be?" Jacobs said. "To put jobs and formats at stake, I knew way back then that I never would do it."

Cross-town rival Mike Costanzo, general manager of Midcontinent's five-station cluster, uses the Arbitron numbers as a programming tool and in sales pitches to clients.

However, he agreed the lack of a survey would have scant immediate effect on how his stations do business. Advertisers will continue to buy air-time if the stations continue to deliver customers, he said.

"The local advertisers are only interested in results at their cash registers," Costanzo said. "The immediate impact, though, may be felt on the national scale."

But Sharon Knoll, media director at Media One, a local advertising agency, said her agency and others in Sioux Falls are prepared to help

national accounts navigate the Sioux Falls market.

"The lack of a survey will hurt, but it won't be hard to overcome," she said. "We're here, we know the market. The biggest problem will be from people who buy from outside the market. As the population grows, we have more franchises, companies and corporations coming here from outside the city. They don't know the stations, so they will have to rely on the stations themselves and the information they send them."



KELO(AM) morning hosts Jack Taylor and Chad McKenzie eat ice cream at a remote for Campbell's Supply in Rock Rapids, Iowa, just over the South Dakota border.

She predicts a group of agencies, or stations, will do their own survey, or hire a firm to do one for them.

Sioux Falls is a stable and highly competitive market. No single station dominates, although country remains the most consistent format. That probably is not surprising, given the relatively small amount of ethnic diversity.

While thousands of newcomers — Hispanics, Eastern Europeans and Africans — have joined a large Native American population to create a thriving minority community, Sioux Falls remains 96.5 percent Caucasian, according to Duncan's Radio Market Guide, 2001 edition.

That has made it relatively easy for Results, Midcontinent and LA Media to carve their respective niches. Results was the first group to bring in a satellite morning show, adding "Imus in the Morning" in the mid-1990s on its KSOO(AM).

At first, it was a difficult transition for the conservative, adult standards KSOO, the city's oldest and most traditional station. And it has created the unlikely and sometimes memorable pairing of Imus and Paul Harvey shar-

ing the morning drive-time.

Time, however, has smoothed the hard feelings of many long-time listeners, who profess offense at Imus' over-the-top humor but still tune in.

"We got a lot of calls and letters from really nice little old ladies who didn't want to see the change," said Jacobs. "And we knew we would get that. But we also knew the program drew really, really good listeners in that male demographic that we really needed to have."

KSOO also boasts some lively after-

noon talk in the form of "Viewpoint University," a local show hosted by former mayor Rick Knobe and sidekick Randy McDaniel. Their domain is politics — Sen. Tom Daschle, a South Dakota Democrat and the majority leader of the U.S. Senate, is a frequent target of Knobe's mostly good-natured conservative barbs.

McDaniel represents the liberal view, although a steady stream of

right-leaning callers often mutes his voice. Results also was the first to tempt teens with a hot-hits format on its KKLS(FM), popularly known around town as "Hot 104.7." An oldies station until Results flipped it in fall 1998, it found an immediate audience with young listeners. While its revenues have held steady at \$1.2 million each year since 1998, its share in 12-plus, Monday through Sunday, 6 a.m. to midnight increased from 10.4 in '98 to 11.7 in spring 2001, according to Arbitron. It is Results' top-grossing station in the market and is No. 2 in the spring 2001 Arbitron survey, the latest data available.

Big-name talent

KKLS has played a direct role in Sioux Falls' ability to attract such hot pop acts as 'N Sync, 98 Degrees, Britney Spears and Christina Aguilera to city stages.

Since its reformed inception, KKLS has outgrown its teen-only label and now counts among its listeners a healthy population of 25- to 49-year-old women. It is third in this category in spring 2001, according to BIAfn.

The same is true of another Results' property, KMXC(FM), which is second in the spring 2001 ratings for women, 25-49, according to BIAfn. Its strength is the morning tandem of Ben Davis and Patty Dee. The two have been on the air together since 1994 and many observers agree they have the most natural and spontaneously funny local morning show in the city.

Results' other stations are country: KXRB(AM) and KIKN(FM). The former is best known for its durability and the loyalty of its listeners and staff.

Ratt Reno, the station's morning personality, helped launch the station more than 30 years ago. Programming Director Joe Morrison is a staunch country music traditionalist. Together,

See MARKETWATCH, page 26 ►

McDaniel represents the liberal view, although a steady stream of

noon talk in the form of "Viewpoint University," a local show hosted by former mayor Rick Knobe and sidekick Randy McDaniel. Their domain is politics — Sen. Tom Daschle, a South Dakota Democrat and the majority leader of the U.S. Senate, is a frequent target of Knobe's mostly good-natured conservative barbs.

McDaniel represents the liberal view, although a steady stream of

Sioux Falls, S.D. Commercial Radio Market Overview				
Station	Owner	Format	BIAfn's 2000 Est. Station Revenue (\$000s)	Spring 01 Share
KRRO(FM)	Midcontinent Media	AOR	1,200	13.0
KKLS(FM)	Southern Minnesota Broadcasting	CHR	1,200	11.7
KELO(FM)	Midcontinent Media Light	AC	1,100	8.8
KMXC(FM)	Southern Minnesota Broadcasting	AC	900	7.1
KYBB(FM)	Southern Minnesota Broadcasting	Class Hits	900	6.7
KELO(AM)	Midcontinent Media	News/Talk	1,100	5.9
KTWB(FM)	Midcontinent Media	Country	900	5.9
KIKN(FM)	Southern Minnesota Broadcasting	Country	1,050	5.9
KSOO(AM)	Southern Minnesota Broadcasting	News/Talk	650	4.2
KXRB(AM)	Southern Minnesota Broadcasting	Country	550	3.3
KSQB(AM)	LA Media	Adlt Stnd	100	2.9
KLQL(FM)	Three Eagles Comm. Inc.	Country	750	2.1
KKHG(FM)	LA Media	Country	675	2.1
KWSN(AM)	Midcontinent Media	Sports	250	1.3
KSQB(FM)	LA Media	Oldies	N/R	1.3
KNWC(AM)	Northwestern College Radio Network	Christian	N/R	N/R
KNWC(FM)	Northwestern College Radio Network	Christian	N/R	N/R
KQAD(AM)	Three Eagles Comm. Inc.	Light AC	200	N/R
KAUR(FM)	Augustana College Association	Variety	N/R	N/R
KCSD(FM)	University of Sioux Falls	Classical	Non-profit	N/R
KRSD(FM)	Minnesota Public Radio	Classical/News	Non-profit	N/R

* N/R indicates that the data category was not reported.

BIA **Financial** **network**

Stations are ranked in order of Arbitron Spring 2001 12+ share. Copyright 2001 the Arbitron Co. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Financial Network through its MEDIA Access Pro Radio Analyzer Database software.

Background: The Big Sioux River as It Descends Toward Downtown Sioux Falls

Complex problems...

WE SPECIALIZE IN RELIABLE, COST EFFECTIVE PRODUCTS FOR YOUR BROADCAST RELATED NEEDS.

- AFS-2 AUDIO FAILSAFE
- CAS-1 CON/AIR SWITCHER
- ACU-1 AUDIO CONTROL UNIT
- DAI-2 DIAL-UP AUDIO INTERFACE
- TTI-2 TIME-TEMP-ID DELIVERY SYSTEM
- MBC-1 MESSAGE BOARD CONTROLLER
- RFC-1/B REMOTE FACILITIES CONTROLLER
- TAS-1 TELEPHONE ANNOUNCEMENT SYSTEM

Innovative solutions!

Sine Systems, inc.

615 • 228 • 3500 (VOX)
615 • 227 • 2367 (FAX)
WWW.SINESYSTEMS.COM

Photo by Dave Eggen



can run my radio station for \$995.



MP3 on any card!
Multiple Streams
No Skipping! No Kidding!

- ✓ Satellite
- ✓ Voice Track
- ✓ Live Assist
- ✓ Automation
- ✓ Internet



MediaTouch

Record and Play MP3, MP2, PCM, ADPCM, and Windows Media Audio on ordinary sound cards. iMediaTouch does more for less!

(888) 665-0501 www.imediatouch.com

Marketwatch

► Continued from page 24

they have made the station the choice among fans of hard-core country music.

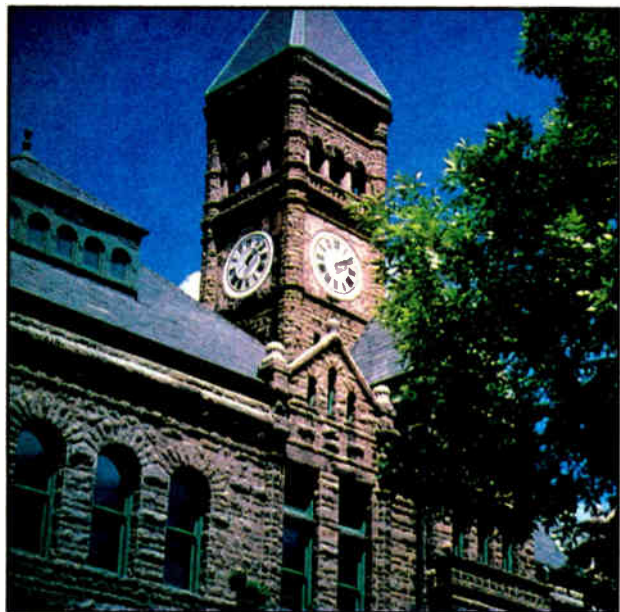
KIKN sounds more contemporary, with a broad reach into the small towns of eastern South Dakota.

Results Radio's six Sioux Falls stations earned \$5.25 million in 2000, according to BIAfn.

Midcontinent earned \$4.55 million with its five Sioux Falls stations in 2000. The company's biggest change in the market lately has been its KWSN(AM) format flip from news-talk to all sports. The change occurred a little more than a year ago, delighting sports fans. The station earned \$250,000 in 2000, according to BIAfn.

KWSN supplements its ESPN Radio coverage with a local afternoon talk show, plus game coverage of local and regional high school and college teams.

At the same time, Midcontinent removed the oldies format from workhorse KELO and converted that frequency to news-talk. The station broadcasts some of the local sports teams' games, but has a contract with the U.S. Hockey League that allows them to broadcast and stream all of the Sioux Falls Stampede games.



The Old Courthouse Museum in Sioux Falls was built in the 1800s with a South Dakota native stone, quartzite, the hardest stone next to diamond. Today the former courthouse holds regional history exhibits.

The KELO morning show is anchored by two of the city's best-known radio voices, Chad McKenzie and Jack Taylor, who gab their way through four hours of hard news, analysis and trivial topics. Mayor Gary Hanson is a frequent guest, along with a crew of regulars on the so-called "KELO Café."

Through all the changes, KRRO(FM) has maintained its niche as a loud rock station, although it has dropped its classic-rock tag for a more modern approach.

Women target demo

KELO(FM) remains the top draw among female listeners throughout the day, with its mix of light music and easy-going on-air personalities. It ranked No. 1 with women, 25-49, Monday through Sunday, 6 a.m. to midnight, in spring 2001, according to Arbitron. The station earned Midcontinent \$1.1 million in 2000.

Also in Midcontinent's stable is KTWB(FM), which Axdahl of LA Media started in the early 1990s as an alternative country-rock station. He sold it to Midcontinent in 1997, which stripped away its "outlaw" image and turned it into a mainstream country outlet.

Axdahl's current crop of stations is an eclectic mix. KKHG(FM) is a modern version of the old KTWB, with a format that's mostly modern country but also includes such mainstream rock artists as Bruce Springsteen, Neil Young and Bob Seger. KKHG earned \$675,000 in 2000, according to BIAfn.

Mixing rock and country is risky, but it makes

sense in the Sioux Falls market, Axdahl said.

"If you go to a Clint Black show or anybody like him," Axdahl said, "the last tunes they do for the encore are songs by (John) Mellencamp and people like that. So you take the rock tunes and mix them in with the most raucous country songs. Technically, you're a country station, but you're also a rock station. And I think that's how people live their lives."

Axdahl's KSQB(FM) targets boomers, mixing favorites from the 1960s and '70s without the doo-wop: Carole King, James Taylor and Elton John are its playlist favorites. KSQB(AM) goes back even further to Frank Sinatra, Johnny Mathis, Neil Diamond and other adult standards.

None of Axdahl's stations is a major player in the market. Together, BIAfn reports that they earned \$775,000 in 2000, although KSQB(FM) did not report its income.

His highest-rated station, KSQB(AM), was No. 11 in the spring 2001 12-plus, Monday to Sunday, 6 a.m. to midnight Arbitron ratings. But Axdahl is not complaining.



The U.S.S. South Dakota was the most-decorated battleship of World War II, having fought in every major battle in the Pacific theater from 1942-45. Pieces of the ship are on display at the U.S. Navy Memorial in Sherman's Park in Sioux Falls.

"We're growing every month. Sioux Falls is a very insulated market. We're insulated from Minneapolis to the east, Omaha to the south and Fargo to the north. It's what I call a standalone community, educationally, medically and for all other industrial reasons. To me, 15 stations in a market this size — especially one that is as isolated as we are — is not unreasonable at all. Everybody's doing OK."

That is the consensus. Station managers cite an increase in diversity in the kind of clients who are buying advertising on the radio: Wireless communications and the competitive medical community are turning to radio as never before.

"It's a progressive and growing market," Jacobs said. "It has matured. Businesses are buying radio differently than they did 25 years ago. They're buying more consistently. It used to be one week a month. Now it's a more regular schedule."

Dykstra, Midcontinent's sales manager, said the growth of the city has enabled stations to target different segments of advertisers and listeners alike — and all are doing reasonably well.

Sioux Falls, S.D.

Market Rank: 213

Market Revenue Rank: 169

Number of FMs: 14

Number of AMs: 7

Estimated Revenue

(in \$000s)

1997: 9,300

1998: 10,900

1999: 11,000

2000: 11,500

2001: 11,500

2002: 12,200

Revenue Growth:

'95 - '00: 6.5%

'00 - '05: 4.3%

Local Revenue: 80%

National Revenue: 20%

2000 Population: 124,000

Per Capita Income: \$20,930

Median Income: \$44,022

Average Household

Income: \$54,206

BIA Financial
network

Background: The Washington Pavilion of Arts and Sciences in Sioux Falls

"It's like the NFL — you get parity by adding teams. It's the same thing with radio in this market. When I was a kid, it was KELO and KSOO and that was about it. You really did have a dominant station, but those days are gone," Dykstra said.

Dan Nelson, public affairs director for the Sioux Falls Chamber of Commerce, gives the radio groups high marks for being responsive to the community and its business needs.

"The two major entities that seem to represent corporate radio — Midcontinent and Results — both maintain locally produced talk-radio outlets, which allow for a community exchange of topics and ideas. They've been real good about creating a dialogue for the community."

In addition to its 15 commercial stations, Sioux Falls supports a handful of public, college and Christian radio outlets. Listeners can choose between South Dakota Public Radio's KCSD(FM), based in town, or tune to KUSD(FM) in Vermillion, S.D., 50 miles to the south.

Public radio

With Sioux Falls just 15 miles from the border between Minnesota and South Dakota, Minnesota Public Radio has courted its citizens with its station KRSD(FM) and an MPR affiliate at Augustana College, KAUR, both in Sioux Falls.

Although the tiny station is invisible in the market's ratings, long-time observers credit KAUR, the quirky college station, for introducing discerning listeners to an array of new music. The station also has provided a training ground for some of the region's broadcasters.

Religious stations, including the Northwestern College Radio Network's traditional KNWC(AM/FM) and the Educational Media Foundation's contemporary low-power KLOV(FM) occupy other spots on the metro dial.

In addition, regional powerhouses such as Wallace Christensen's KISD(FM), from Pipestone, Minn., and Saga Communications' WNAX(AM-FM) in Yankton, S.D., which broadcasts from nearby Pipestone, Minn., attract healthy segments of out-of-market listeners.

While WNAX doesn't appear on Arbitron's survey of Sioux Falls, the oldest radio station in South Dakota targets the significant rural population just outside the Sioux Falls metro. Last year the full-service station had the highest billing "stick" in the region, earning \$2.7 million, according to BIAfn.

"We're a full-service station, but we specialize in hogs and frogs," said Davis Onsted, general manager of WNAX, in explanation of the station's commodities exchange news coverage. "We're in a farm area and we cover regional news extensively."

Bob Keyes is a features editor and former media reporter for the Argus Leader, Sioux Falls newspaper. Contact him in Sioux Falls at (605) 331-2317 or send e-mail to bkeyes@argusleader.com.

Traffic Guild Seeks Salary Info

How do you stack up, salary-wise?

The Traffic Directors Guild of America, an association for traffic-related radio personnel, has launched its second annual salary survey of traffic directors, business managers, office managers and other "back office" radio station office personnel.

Larry Keene, co-founder of the two-year-old TDGA and a Wicks Broadcast Solutions' regional manager, is project coordinator of the salary survey project. The report is due in early January.

"Our goal in this project is to find salary levels by market categories, station types (commercial, non-commercial and public radio), the extent of

benefits and general overall job satisfaction."

This year's survey also will be compared to the association's initial study at the close of 2000, which Keene said might spot trends in a year of economic uncertainties.

"We invite all radio station office and administrative personnel to participate in this year's survey," Keene said.

The survey form is available online in the newsletter portion of the TDGA



TRAFFIC DIRECTORS GUILD OF AMERICA

Web site at www.tgda.org or visit www.tgda.org/surv2001.pdf.

Participants will receive final tabulations via e-mail. The results will appear in the TDGA Web site newsletter and members' section of the site.

Keene invites anyone who is not receiving the TDGA newsletter or e-mail alerts to request that their names be added to the e-mail alert lists. Contact TDGA's COO Carol Anderson via e-mail to tgda@earthlink.net.

Keene said the TDGA's mission is "to foster pride in our unique profession and to promote the contributions we provide to the radio broadcasting industry. The Traffic Directors Guild seeks to enhance our careers through information, cooperative services and education."

For more information contact Larry Keene in New Jersey at (609) 390-0898 or e-mail to larrykeene@earthlink.net.

— Laura Dely

New Members Join Arbitron Council

Following the Arbitron Radio Advisory Council meetings in Naples, Fla., the company announced that five new members were elected to its council. The council provides a forum for communication between Arbitron and its client radio stations. The new members, who will serve three-year terms that begin Jan. 1, 2002, are:

- Neysa Hinton, *KMHX(FM)*, Santa Rosa, Calif., to represent adult contemporary, non-continuous markets;
- Steve Goldstein, *WLZR(FM)*, Milwaukee-Racine, Wis., AOR, continuous markets;
- Val Garris, *WAOA(FM)* Melbourne-Titusville-Cocoa, Fla., *CHR/Top 40*, non-continuous markets;
- Earnest James, *KFRC(AM/FM)* San Francisco, gold/oldies, all markets;
- Susan Ali Shepherd, *KSOL(FM)/KZOL(FM)*, San Francisco, Hispanic stations, all markets.

David Pearlman, senior VP of Infinity Radio, will serve as chairman of the council for 2002.

Tom Skinner, GM, *KZST(FM)*, Santa Rosa, Calif., will serve as vice-chairman. Gary Fries, president, RAB, New York City, was re-appointed representative-at-large.

STATION SERVICES

Crook and Chase Now On USRN

Following its recent multi-year agreement with Crook and Chase, United Stations Radio Networks announced that approximately 300 radio stations will carry the "Crook & Chase Countdown."

With co-hosts Lorianne Crook and Charlie Chase, the country radio program is a weekly mix of hits and celebrity interviews.

United Stations will assume network responsibilities including marketing, distribution, advertising sales and production.

Launched in 1989, the four-hour show has built an audience with its music intensive and celebrity-driven format.

Crook and Chase also teamed up for 11 years with TNN to host "Crook & Chase," an entertainment news series on television.

They join United Stations' weekly and seasonal country offerings including "Super Country USA with Ben and Brian," "The Road," "Thunder Road," "The Academy of Country Music Awards Special," "The American Christian Music Review" and "Country Giants" as well as comedy, morning prep and special holiday programming.

United Stations Radio Networks calls itself the nation's largest independently owned and operated radio network. It distributes and produces format-specific including adult contemporary, album rock, contemporary hit, oldies, smooth jazz, urban and talk. Dick Clark and Nick Verbitsky founded the company in New York in 1994.

For more information, contact Julie Harris at United Stations Radio Networks in New York at (212) 869-1111.



Calif. Milk Board Believes in Radio

Cows are good salespeople.

The General Sales Managers Council of the Southern California Broadcasters Association honored Deutsch L.A. with two awards for outstanding radio creative in October: Best Spot of the Month, for the Deutsch March 2001 spot "300 Sunny Days," and SCBA's inaugural "Radio Stars" Award, presented for continuous creative excellence in radio broadcast advertising.

"300 Sunny Days" is part of the Deutsch "Happy Cows" campaign for Real California Cheese and The California Milk Advisory Board. The spots feature cow celebrities, Janice and Diane.

Michael Freeman, CMAB director of advertising services, said the radio component of the multimedia campaign is one of the best-loved parts of the CMAB's promotion.

"I've never seen anything like it in the years that I've been working with the milk board," Freeman said. "Every time we run a radio tag inviting people to buy a 'Happy Cows' T-shirt online, visits go up significantly and T-shirt sales increase. It's truly a testament to radio's effectiveness," Freeman said.

Deutsch L.A. was the first recipient of the "Radio Stars" award. According to SCBA President Mary Beth Garber, "The General Sales Managers Council selects only the most deserving recipients for their Best Spot of the Month Awards and we began to see a pattern developing with Deutsch, a pattern of consistent outstanding creative. They had won the Best Spot of the Month award four times in the past three years.

"It was only fitting that we create this 'Radio Stars' Award to recognize their achievements in radio."

When you require the ultimate in accurate timing



WHEN you require the best, most accurate in precision timing look only to ESE. Designed for "Precision Timing", ESE Master Clocks & Accessories have been the industry standard for over three decades.

Whether using GPS, WWV, Modem, Crystal or line frequency accuracy – all ESE Master Clocks can drive digital or analog slave clocks, as well as interface with video and/or computer based systems. Call or visit our web site for more details.



142 Sierra Street • El Segundo, CA 90245 USA
Phone: (310) 322-2136 • Fax: 310.322.8127

www.e-se-web.com

Massive BSW Price Reduction on Orban 8400's



FREE Hafler Studio Monitors (with purchase)

There's Never Been a Better Time to Buy the Popular 8400 Processor

Loaded with Motorola's latest DSP chips, the Optimod 8400 comes equipped with more than five times the raw processing power of its predecessor. This vastly augmented digital horsepower enabled Orban engineers to implement sophisticated new processing algorithms (seven years in the making) that extend virtually all performance parameters. The 8400 retains many proven OPTIMOD-FM 8200 features, such as the five-band and two-band processing structures, but with its supercharged processing power, there is a clearly audible improvement, namely a noticeably louder and brighter signal, with the smoothness and pristine clarity needed to hold listeners for extended periods. If you are in the market for an FM processor, take advantage of BSW's incredibly low price, plus receive a pair of Hafler M5 studio monitors (pictured at right). Now that's a great deal!

Orban 8400 List \$10,700.00 **ONLY \$8,995.00**

INCREDIBLE SALE



6-Channel Symetrix Headphone Amp Exclusively at BSW for Only \$299.00!

BSW bought a truckload of these Symetrix amps so we could save you a load of money. This is without a doubt the best headphone amp you can buy for the price. **Features:** 6 direct inputs and 6 direct outputs; crystal clear, low distortion for reduced listening fatigue and enough power to please even the most discriminating DJ. Don't miss this opportunity! Once these are gone, the price goes back up.

Symetrix 506E List \$529.00 **ONLY \$299.00**

Save 43% **ONLY at BSW**



SALE \$199⁰⁰

NEW

This Amp Rocks!

Hafler's new super-affordable TA1100 is a two-channel, convection-cooled (no fans!), MOSFET-metal oxide semiconductor field effect transistor power amp. The circuitry used in the TA1100 has been successful in bringing new levels of clarity and intelligibility to broadcast facilities. **Features:** "soft start" protects speakers; thermal sensing network amp monitors the heatsink and transformer temperature; LED indicators; TA1100 offers 40 watts per channel into 8 ohms; TA1600 offers 60 watts.

TA1100 List \$299.00 **ONLY \$199.00**

TA1600 List \$399.00 **ONLY \$299.00**

LOWEST PRICE On Broadcaster's Favorite On-Air Mic

The Electro-Voice RE20 dynamic cardioid mic is an industry staple and extremely durable. Its patented Variable-D™ design eliminates bass-boosting proximity effect when close micing and its bass roll-off switch helps to shape low end response. Includes stand clamp.

Electro-Voice RE20 List \$798.00 **ONLY \$369.00**



SALE \$369⁰⁰

The World's Best



BROADCAST SUPPLY

Instant Replay Only \$99



DR554-E (Instant Replay)

360 Systems "Instant Replay" down and \$99⁰⁰ month!*

So, is this cool or what? Instant Replays for only \$99.00! 360 Systems' Instant Replay places 1,000 audio clips at your fingertips. Get instant access to an entire audio library of your own. Useful new editing tools like head and tail trims, fade-ins, fade-outs, and extract sound effects from a bed, or make loops of music. Install it in the studio or control room. Thousands of entertainment professionals use it to their shows without the added expense of removable hard drives.

Save your cash and get the industry's most popular audio interface for just \$99.00 down. Call BSW toll free today to get yours!

*\$99.00 down and 24 lease payments of \$99.00. \$1,000 purchase required after 24 months. Subject to credit approval. Monthly payment slightly higher for businesses. In some states, the monthly payment price does not include state sales tax which will be added. Call for additional details and instant credit application.

FREE BSW CATALOG Call Today

Hurry, Sale ends 12-31-01

Some items are limited to stock on hand.

Order Today 1.800.426.8

Source for Professional Audio Products.



Replay

00/month*

EXCLUSIVELY FROM BSW

30 Systems

for only \$99⁰⁰

exclusively from BSW.
 fingertips! Music, sound effects, any audio bit.
 creation. The new Dash-E software includes power-
 outs, and even gain changes. Now it's easy to
 and ambient effects. Pack it up for the road, or
 liners use Instant Replay each day to bring value
 media.
 audio player
 ours.



Incredible Products at Incredible BSW Sale Prices



NEW

SALE \$99⁰⁰ ea.

Hafler

Hafler M5 Monitor Speaker

This is absolutely the best speaker buy of the year! The Hafler M5 is a passive reference monitor utilizing an elaborate crossover network and tweeter overload protection. The result is a compact package offering high power handling and unmatched sound quality for the price. Magnetically shielded. Power handling 20-200W. Dimensions: 6.75"W x 12.25"H x 7"D. 10 lbs..

M5 ONLY \$99.00 ea.



SALE \$99⁰⁰



Behringer 8-Channel Mixer

Before you dismiss this mixer as a \$99.00 toy... wait up. We've never been more impressed with a quality mixer that at \$300.00 or \$400.00 would be a bargain. This 8-channel mixer (4 mono and 2 stereo) is ideal for applications that demand quick mixing in a limited space. **Features:** 4 mic preamps with phantom power; 3-band EQ; 2 AUX sends; 2 stereo AUX returns; durable steel casing.

MX802A ONLY \$99.00

NEW Behringer Audio Tester

This durable tester accepts XLR, mono and TRS phone (1/4", 1/8", TT), RCA and MIDI. The LED display shows which input pin is connected to which output pin. Separate shield and phantom power LEDs indicate proper shield connection and phantom power presence. The CT100 requires insertion of only one plug and indicates shorts and opens, as well a continuity check. A test tone generator (1 kHz and 440 Hz) is also included. Don't just buy one... at this price buy several!

CT100 ONLY \$35.00



Cable Tester ONLY \$35.00

UNBELIEVABLE Deals on 5 Packs!



SALE 5 for \$89⁰⁰

KOSS

Great low cost headphones for studio or home use. Lightweight, with a full enclosure design.

TD60PKG (pack of 5) ONLY \$89.00



SALE 5 for \$49⁰⁰

PROCO

Quality low-loss 25' mic cables at a great price. Complete your new mic package with this 5 pack!

M25PKG (pack of 5) ONLY \$49.00



SALE 5 for \$99⁰⁰

BEHRINGER

You'll be pleasantly surprised at the first rate sound from these very well built, very inexpensive mics! Includes a hard case for each, and an on/off switch. An unbelievable deal!

You can also purchase multi-colored windscreen 5-packs for only \$24.00!

XM30005PKG (pack of 5) ONLY \$99.00
WS912PKG (pack of 5) ONLY \$24.00



SALE 5 for \$89⁰⁰

These durable mic stands also include a mic adaptor and cable clips. An incredible bargain exclusively from BSW.

MS2000PKG (pack of 5) ONLY \$89.00

1-800-343-434 or www.bswusa.com

World Radio History

The Gracies

Gracie Awards Deadline Nears

The Foundation of the American Women in Radio and Television seeks entries for the 27th Annual Gracie Allen Awards, the broadcast industry awards that recognize exemplary programming created by women, for women or about women, as well as outstanding achievement by individuals.

The 2002 "Gracies" entry deadline is Friday, Dec. 14.

Last year in the radio category, winners included CBS Radio News, Radio Disney and National Public Radio. Award categories include: Outstanding Achievement by an Individual; Programming/Entertainment; Programming Information; News; Advertising/Public Service and New Media.

Make the grade

To qualify for entry, programs must have aired for the first time between Dec. 1, 2000 and Nov. 30, 2001. National and Grand Award winners will be honored at the Gracie Allen Awards Gala, to be held in the spring in New York. Local market award winners will be honored at a luncheon prior to the evening gala.

Gracie Allen, half of the comedic team formed with her husband George Burns, is credited with the creation and execution of one of radio's first promotion campaigns: the search for her missing, fictional brother.

In 1933, in an effort to promote a new time slot for the "Burns and Allen Show," Allen walked on to other radio shows, such as Jack Benny's and Eddie Cantor's, to ask tearfully if anyone had seen her brother.

Within days, the gag caught on and was showing up in Broadway shows and



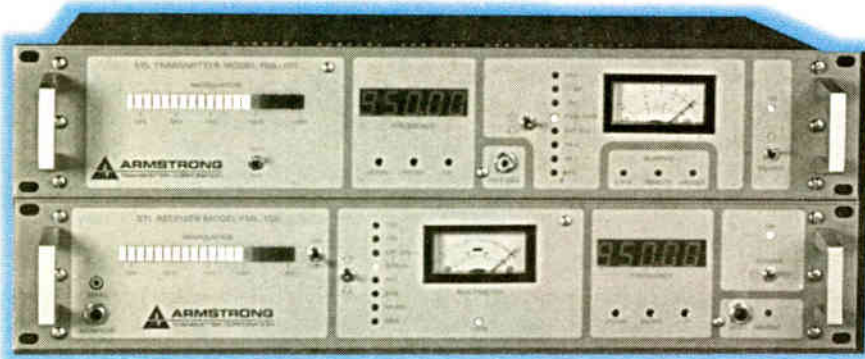
Cathy Hughes of Radio One presented a 'Gracie' to jazz pianist Marian McPartland for Outstanding Individual Achievement for a Radio Personality last year. McPartland is host of 'Piano Jazz' on NPR.

radio soap operas. Some arrested men reportedly told police that they were Gracie's missing brother. Burns, in his book "Gracie: A Love Story," said the missing-brother campaign launched the team as radio stars.

To obtain a copy of the Gracie Allen Award Call for Entries, visit the foundation Web site at www.awrt.org/awards/entry_form.html or contact AWRT headquarters in Virginia at (703) 506-3290.

— Laura Dely

Frequency Agile STL Systems



▲ If you are looking to deliver clean, crisp audio to your transmitter via microwave, Armstrong FML-10 STL system offers unsurpassed audio purity in a rock-solid, feature-packed package.

▲ Built to tough manufacturing standards throughout, FML-10 system features microprocessor controllers, advanced PLL circuitry, ultra linear VCO and front panel frequency programmability with digital frequency readout.

▲ Currently in service at over 300 stations in 21 countries, this field proven design is a "rock-solid" STL choice for any station.

Complete System Under \$5500.00
Same Day Shipping
30 Day Money Back Guarantee



ARMSTRONG
TRANSMITTER CORPORATION

4835 N. Street • Marcellus, NY 13108 • PH: 315/673-1269 • Fax: 315/673-9972
E-mail: info@armstrongtx.com • www.armstrongtx.com

STATION/STUDIO SERVICES



At Christmas 2001 - May God Bless America

Behold, the virgin shall conceive and bear a Son,
and shall call His name Immanuel ("God with us").

Isaiah 7:14

For unto us a child is born, unto us a Son is given.

Isaiah 9:10

For God so loved the world
that He gave His only begotten Son,
that whoever believes in Him
should not perish
but have everlasting life.

John 3:16

www.graciebroadcast.com

BALSYS

TECHNOLOGY GROUP, INC.

PROFESSIONAL BROADCAST
ENGINEERING SERVICES

Analysis - Installation - Support

7141 Tallowtree Lane
Orlando, FL 32835
Tel: 407-822-7055
Fax: 407-296-2587
www.balsys.com
sales@balsys.com

**SPACE
AVAILABLE**

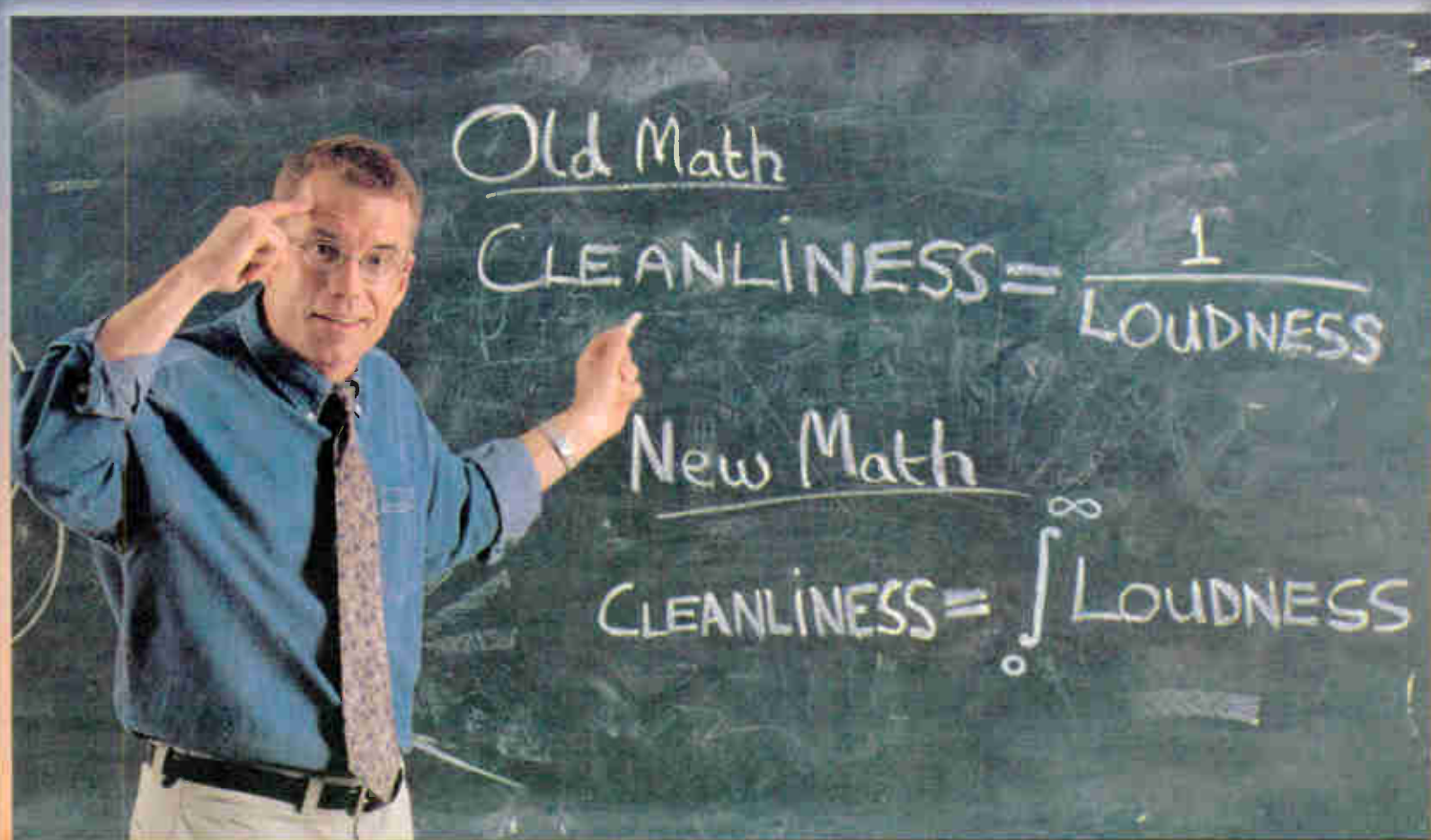
Call Simone for Details
1-703-998-7600 ext. 154

ATTENTION PROVIDERS!

Promote your services to **Radio World's** readers. Reach Radio Station and Recording Studio owners/managers and engineers with your message.

For information on affordable advertising
call **Simone** at **1-703-998-7600, ext. 154.**

Process This!



Introducing

The NEW Aphex 2020MkII



The original Aphex Model 2020 audio processor set the standard for audio quality, loudness and extended coverage. Not content to sit on its laurels Aphex continued to research ways to improve performance even further. The result is the 2020MkII.

New processing algorithms and circuit designs, in addition to the fifteen proprietary circuits* from the original, allow even greater loudness without sacrificing a clean, natural sound. The MkII's increased flexibility also gives a station the ability to create its own unique sonic signature. New features include a split band optical high frequency limiter, a low distortion overshoot compensated low pass filter* (with no spurs), improved remote control interface, RDS, and dual composite outputs.

Audition the new 2020 MkII on your station and you'll find that Aphex has really done its homework—creating a processor with performance and features unmatched at any price. The 2020MkII—in a class by itself.

APHEX
SYSTEMS

Improving the way the world soundsSM

11068 Randall Street, Sun Valley, CA 91352 U.S.A
818-767-2929 Fax: 818-767-2641 www.aphex.com

*(patented or patent pending)

RAB Show Coming Soon — Sign Up Now

The Radio Advertising Bureau is promoting its 2002 Sales, Management and Leadership conference at Disney's Coronado Springs Resort in Disney World, Orlando, Fla., this winter.

The dates for the show are Feb. 7-10, 2002. Registration is \$495 per person or save \$200 when you register two or more at the same time — \$395 per person.

Former airline pilot Captain Al Haynes will deliver the opening keynote on Friday morning, Feb. 8 at RAB2002.

Haynes will discuss how training, planning and teamwork helped him and his crew save the lives of 184 people in July 1989.

Haynes piloted United Airlines Flight 232 to a crash landing in Sioux City, Iowa, after engine failure rendered the craft only marginally controllable. The majority of those onboard survived and Haynes has attributed that success to "luck, communication, preparation, execution and cooperation."

For information and to register, call Gail Steffens at the RAB in Dallas at (800) 917-4269 or visit www.rab.com.



RAB, BMI Provide Minority Scholarship

The Radio Advertising Bureau is offering a week-long training program aimed at helping new salespeople.

The organization describes its Radio Training Academy as an intensive classroom and interactive program focused on real-world skills.

RAB and Broadcast Music Inc. are accepting nominations for a new, joint scholarship, called "FastStart to Radio Sales Success." The scholarship is designed to aid minority salespeople.

RAB and BMI
fast start
To Radio Sales
Success



Each scholarship is worth \$1,200 and covers the one-week tuition at the RAB Training Academy in Dallas. Tuition may also be used for a Training Academy extension class.

The "FastStart" selection committee comprises 13 members of the radio broadcast community with credentials and interest in the ethnic and cultural diversity of the radio industry.

The application deadline for the FastStart scholarship is Dec. 31. There will be 25 minority scholarships awarded for the 2002 academic year.

The Training Academy is presented at the RAB facilities in Dallas. The RAB continues the experience with ongoing faculty-student contact, periodic appraisal and further opportunities for advanced skills training after graduation.

In one year of operation, the RAB Training Academy's 300 graduates report sales performance that is "completely off the charts," according to the RAB.

"Training Academy graduates are armed with critical skills and confidence and routinely report sales figures far exceeding expectations," the RAB stated.

To obtain an application for the FastStart scholarship, visit www.rab.com/faststart_home.htm.

Coming in
January 2002

2002
Radio World

READERS' CHOICE AWARD
& Sweepstakes

Your Opinion Counts

For 25 years, Radio World has been your trusted resource for product news and information. Starting next year, we're giving our valued readers the opportunity to express their opinions about the products that affect their daily lives. Here's your chance to sound off and tell the industry which products work for you.

Radio World

2002

Source Book & Directory

Here's How It Works

In early January, you will receive Radio World's 2002 Industry Source Book, our annual vendor directory. Included with each Source Book will be a ballot that lists new radio broadcast products in 12 categories. The ballot will include Web URLs so you can learn more about the nominated products.

Then, you will be asked to vote for your favorite product in each category via a mail-in or fax ballot or through an online Web site ballot. Radio World will announce the winners in our April 10, 2002, issue and at the NAB2002 show.

But Wait, There's More — Cast Your Vote & Win!

While submitting your ballot for the Readers' Choice Awards, your name automatically will be entered in our Readers' Choice Sweepstakes 2002. Due to the overwhelming response of our Silver Sweepstakes this year, we've decided to extend the contest. This means that 26 more great products will be given away in 2002. We will choose the winners in random drawings and announce them in every single issue of Radio World next year.

Watch for your copy of the 2002 Source Book & Directory coming in January.
Get ready to vote for your favorite products and win!

◆ READER'S FORUM ◆

What Do You Think?

No one speaks their minds like Radio World readers.

Reader's Forum appears on the inside back page of every issue.

WEB WATCH

Net Radio: Shakeouts and Pullbacks

Craig Johnston

This Web Watcher has found a perfect description of what's transpired lately in the Internet radio business: a recent **Yankee Group** report that reads like a "good news, bad news" joke.

According to the report, the Webcasting industry is perched on a precipice between genuine profitability and failure. So on which side of the knife-edged ridge will the industry fall?

"There's a significant percentage who won't make it," said **Ryan Jones**, media and entertainment analyst for The Yankee Group and the report's author. The ones that are relatively well established now will survive and thrive, he said, once the advertising market for Webcasting becomes established.

The study found one key to survival is the element of a Webcaster's business metric known as the **cashflow per thousand listener hours**. They point out that some Webcasters, facing high rights fees and streaming costs, **lose money at the rate of \$65 per TLH**, while others, with more economical rights agreements and efficient distribution methods, can **earn up to \$350 per TLH**.

Large players are now entering the Webcasting space, Jones said, because they have observed three positive signs: serious consolidation of the players, the reality of the music download business and the growth of online listening, which has tripled in the last year, according to **MeasureCast**.

Because one of the major expenses the Yankee Group study refers to are rights agreements, there is great interest in the three-week suspension of the **U.S. Copyright Office Arbitration Royalty Panel** hearings. The arbitration panel will set rates to be paid to the **Recording Industry Association of America** by the **Digital Music Association** streaming radio members.

The panel issued the order Nov. 9 in response to a request from the RIAA and the DMA. The Copyright Office's order stated that the opponents believed that there was "significant probability that negotiations will be successful," but that they required a stay in the proceedings to achieve such success.

CARP delayed

The CARP proceedings were on schedule, losing only Sept. 11 itself to the terrorist attacks. The suspension will move their statutory reporting date from Jan. 30 to Feb. 20, 2002.

And who could be a larger player than deep-pocketed **AOL Time-Warner**, which launched **Radio@AOL** in mid-October?

The service will be available only to AOL members using AOL's new 7.0 software. While that limits potential listeners to AOL's own member universe, it's a universe that is 31 million strong.

Radio@AOL features more than **75 channels of music programming** covering a range of music genres and eras; news, sports, talk and music programming; "Celebrity Spins" stations from 28 favorite artists; as well as AOL exclusives, including "Just4Kids," "Global Beats," "Top Classical" and seasonal and holiday features.

The service also will feature live streams from terrestrial stations, including alternative **KPIG(FM)** of Salinas-Santa Cruz-Monterey, Calif.; **NPR's WFMU(FM)** of Jersey City,



N.J.; rocker **WOXY(FM)** of Oxford-Cincinnati; and **NPR's KCRW(FM)** of L.A.

Some other deep-pocketed competitors may fear antitrust actions to come from the **U. S. Department of Justice**. Two nascent monster online subscription services, **Sony/Vivendi Universal/Microsoft's**

See WEBWATCH, page 34

NET RADIO SERVICES

Telos Updates Zephyr Xstream Group

Telos Systems has a free automatic download available to upgrade its ISDN broadcast audio codecs in the Zephyr Xstream family.

The "Xstream v1.5.5" software can be downloaded and installed using an FTP connection with Zephyr Xstream's built-in update function.

The v1.5.5 software adds enhancements including:

- Fraunhofer's latest coding methods, high-quality MPEG-AAC and low-delay MPEG AAC-LD. Fraunhofer invented MP3.
- A new, exclusive Layer-3 Dual Decoder Mode, which allows reception of two independent mono Layer-3 streams from distant codecs at 56 or 64 kbps each. The company says this mode, exclusive to Zephyr Xstream, allows more transmit/receive flexibility than any other codec.
- End-to-end ancillary data support with eight bidirectional contact closures as well as serial data transmission, available in all

MPEG Layer-3 and MPEG-AAC/AAC-LD modes, as well as Layer-2 mono and half modes (64 kbps).

- A "local control option with "panic dial" dial-on contact closure ability for all eight closures.
- Added choice of consumer or profession-

al output line-levels in models featuring stereo mixers.

- Added MPEG Layer-2 support transmission of audio at 32 kHz.

Before updating, customers should consult with Telos Systems Technical Support at www.telos-systems.com/support.



Zephyr Xstream and Zephyr Xstream MXP

For all your audio & audio-for-video needs:

BROADCAST

www.BRADLEYBROADCAST.com

PRO AUDIO

800-732-7665

Local Phone: 301-682-8700 • Fax: 301-682-8377 • Address: 7313-G Grove Road, Frederick, MD 21704

Web Watch

► Continued from page 33

Pressplay and **AOL/TimeWarner/EMI/Bertelsmann AG's/RealNetwork's MusicNet**, have been subject to complaints from independent companies who wish to start online music subscription services.

The independents claim they have been unable to strike licensing deals with the record labels. It's no surprise that these new services have raised questions from the DOJ.

Since non-label-owned subscription services have to pay license fees out of pocket, the DOJ has issued subpoenas demanding documents that reveal the terms of PressPlay and MusicNet's licensing deals.

(To be fair, it should be noted that one of the labels, EMI, has licensed its music to MusicNet and PressPlay and as well as to start-ups such as **FullAudio** and **Streamwave**.)

MusicNet and PressPlay may face difficulties across the Atlantic as well. The **European Union** said it is considering banning the label-owned online subscription services.

At the same time these recording companies are launching their own download sites, they've filed suit to stop one of the most popular file-trading networks which appeared after **Napster** was forced from the field.

The **RIAA** and the **Motion Picture Association of America** joined to sue **MusicCity**, **Kazaa** and **Grokster**, which the plaintiff's call a "21st-century piratical bazaar."

The defendant companies point out that because no central index of downloadable files is involved, a successful suit may not stop the file swapping. As long as people continue to distribute the software unofficially, music file swapping can continue unabated, the defendants said.

Most huge

The largest radio group owner in the country, **Clear Channel**, has shifted responsibility for its stations' Web sites from **Clear Channel Interactive** back to the local stations. Operating responsibility for the **more than 800 radio Web sites** now belongs to **Clear Channel Radio**.

The company cites increased operating efficiencies and local flexibility as reasons for the change. **Clear Channel Interactive** will continue to support local Web development and remain involved in other Internet-related areas, including some form of Internet radio.

Because **Clear Channel's** centralized control of its stations' Web sites along with its control of concerts and other events were raising antitrust questions, the **Web Watcher** wonders if decentralizing station Web site control was a way of turning down the antitrust heat?

Meanwhile, **Clear Channel's** syndication arm, **Premiere Radio Networks**, took steps to correct its cash flow per TLH by charging streaming listeners.

In mid-October, **Premiere** quietly turned off free streams of "**The Dr. Laura Schlessinger Program**," "**Coast to Coast With Art Bell**," "**The Phil Hendrie Show**," "**The Bob and Tom Show**" and "**The Jim Rome Show**." Listeners must now pay \$6.95 a month for access to the programs. (**Premiere's Rush Limbaugh** has had a \$39.95 annual fee for streamed listening since August.)

Premiere, which pays \$1.5 million per year to stream the shows, said it was a

tough decision.

"Time will show we have found a solution to allow that listening connection to continue, vs. no longer (providing) the service, free or otherwise," **Premiere President/COO Kraig Kitchin** told *The New York Post* Oct.23.

With the labels' online subscription services (**Pressplay** and **Musicnet**) set to launch at the end of 2001, it should come as no surprise they will represent an ample part of the streaming media revenues in the year ahead. In fact, **AccuStream iMedia Research** predicts subscription dollars may top ad dollars in 2002.



For the current year, its study said the advertising downturn of 2001 and the Sept. 11 terrorist attacks will reduce ad revenues from **AccuStream's** predicted \$138 million to \$56 million (of which audio is about 40 percent). Its latest estimate of 2001 subscription revenues is \$35 million.

Charge 'em

AccuStream's 2002 estimates for both ad and subscription revenue from streaming services are about \$130 million each. But a continued downturn in the advertising marketplace will certainly have a downside impact on ad revenues.

So much for the pay-to-listen services that have opened over the past month. A number of companies in the advertiser-dependent streaming music space have disappeared, beginning with **ClickRadio**. The company closed down in mid-October, laying off its entire 140-member workforce.

ClickRadio had been making a slow climb. **Gateway Inc.** was bundling **ClickRadio** software on its new PCs and the service had acquired about 300,000 users for **ClickRadio's** free service. But a badly needed, third round of financing was scuttled with the fall of the **World Trade Center**. As a result, many of **ClickRadio's** laid-off employees may qualify for disaster relief.

Things went no better for **NetRadio.com**, which pulled its 100 channels off the Net in mid-October. The **Webcasting** pioneer, failing to secure badly needed funding, shut down its streaming operation and terminated most of its staff.

A posting on **NetRadio's** Web site stated: "It's not for a lack of hard work, passion, talent or dedication to our ideas. And it's certainly not for lack of support from our listeners — who month after month have made us one of the highest-trafficked sites on the Web."

They may not be completely gone. Later in the home page message the company stated: "**NetRadio** still exists as a company and who knows? We might be back online some day. We still believe in our idea and in the fact that Internet radio has a strong, viable future. We look forward to the possibility."

A third **Webstreamer**, **RadioWave.com**, took much of October to do its death dance, downsizing the company from 35 to 28 early in the month, then "pulling the plug" (as it said on its Web site) in October's final week.

The streaming services provider for terrestrial radio stations said it was attempting until the final moments to merge with another company.

Radiowave was one of the few **Webstreamers** who provided its service in exchange for a share of ad revenue. In the end, that market was not enough to bring the company to profitability. The company's demise came in spite of sending out 1.5 million streaming hours a month.

Finally, **San Francisco-based AudioBasket.com**, which until recently supplied personalized audio news and information over the Internet, let it be known that it



plans to merge with **eMotion**, a searchable storage and digital delivery service provider. There are no plans to resurrect **AudioBasket's** prior consumer **Webstreaming** service.

Not all ad-supported streaming news was of disappearing acts. One of the first high-profile streaming radio services is returning to the space: **Terra Lycos** and **RadioCentral, Inc.** announced the launch of the new **Lycos Radio**. Their service will offer 14 radio formats at three bit rates in the **Windows Media** format.

"**RadioCentral** brings an extensive radio industry background, making them the perfect company to power **Lycos Radio**," said **David Pritchard**, senior director of entertainment for **Terra Lycos**.

Part of surviving in the streaming space is lowering the expense line (as the **Yankee Group** report at the top of *Web Watch* points out). Because one of the principal expenses Internet radio encounters is the cost of streaming its signals, **Webstreamers** will be closely watching the results of **Radio Free Virgin's** teaming with **Blue Falcon**.

Radio Free Virgin has consistently ranked at or near the top of **Arbitron's** Net radio ratings, which means it have to send out a lot of streams. The more streams, the higher the expenses.

Which is why it has contracted to use **Blue Falcon's** software-based peer-to-peer technology. Its **p2p** system reduces the number of streams that need to be sent from the **Webstreamer's** server by setting up a daisy chain of sorts. The streamed signal goes into one listener's computer, then back out again and on to the next listener's PC. In this manner the stream can be passed on again and again. Thus for the cost of a single stream, a number of listeners can be served.

"With **Blue Falcon**, we can rapidly and cost effectively scale our audience to reach our goal of becoming the most widely distributed radio service in the world," said **Zack Zalon**, general manager of **Los Angeles-based Radio Free Virgin**. "We are very excited about initiating the roll-out across all 40 of our channels."

Lowering the cost of streams wasn't **Radio Free Virgin's** only expense cut. Shortly after the **Blue Falcon** announcement in October, **Radio Free Virgin** announced a deep staff reduction, from 26 to 15. The cuts come mostly from the content programming

area. According to the company, the staff cuts will not mean a reduction in service.

In that same vein, **ChainCast Networks** liked the way their own technology saved money for **StreamAudio** that they bought the company. Among the broadcasters whose signals **StreamAudio** Webcasts are **Cox Radio**, **Entercom** and **Salem**.

ChainCast's peer-to-peer streaming system essentially works the same way **Blue Falcon's** does, reducing the number of streams a **Webcaster** must send out by causing listeners' computers to send the stream on to other listeners.

StreamAudio tested the **ChainCast** system for several months.

"The use of **ChainCast's** technology made **StreamAudio's** business model profitable," said **Darren Harle**, president and co-founder of **StreamAudio**.

This was achieved by reducing the amount of bandwidth **StreamAudio** needed to purchase to stream their station signals.

Financial arrangements have not been announced. **StreamAudio** will operate its business as a division of **ChainCast Networks** and will be managed by **Harle**. The **StreamAudio** service offerings and business models will remain the same as prior to the acquisition.

Being No. 1 is no insulation from being caught in a cost squeeze. One day after topping the **Arbitron** September **Webcasting** ratings, **Webstreamer Live365.com** laid off 16 employees, including some executives.

How solid is **Live365's** lead in the ratings? The **Webstreamer's** 4.9 million aggregate tuning hours were more than five times that of the next-highest rated network.

Digital and streaming media infrastructure and services provider **Loudeye Technologies** announced a nearly 10 percent reduction in staff. The **Seattle** based-company is consolidating its operations in the facilities of its recent **Webstreaming** acquisition, **Activate**.

"We are realizing increased staffing efficiencies and cost savings through consolidating technology, facilities and equipment from our recent acquisitions," said **John T. Baker**, **Loudeye** chairman and chief executive officer. **Baker** said the moves put the company on track for reaching profitability by the end of 2002.

Things have been hard for **Webstreaming** infrastructure companies too: witness Oct. 11 for streaming communications network operator **iBEAM**. That day it agreed to be acquired by **Williams Communications** (which already held a 49-percent stake) and at the same time filed Chapter 11 bankruptcy. **Williams** will pay \$25 million, plus assuming debt.

While the deal is pending, **Williams** is loaning **iBEAM** money to allow them to continue service to its customers.

"The combination of **iBEAM's** unequalled expertise in streaming communications and **Williams Communications'** award-winning network and broadband media infrastructure creates the market's most powerful solution for our complementary customer bases," said **Peter Desnoes**, chairman, president, chief executive officer of **iBEAM**.

And finally, **CBS Records** has signed a two-year contract with **Web host provider WebStream** to produce a portal site to highlight the company's artists, comedians and actors. **WebStream** will also manage the transaction processing and e-commerce for the site. The Web site will feature music, streaming video in different bit-rate streams, fan club information and special events.

Craig Johnston is an Internet & multimedia producer in Seattle. Contact him via e-mail to Craig@CraigJohnston.com.

In the Spotlight!

The Broadcast Richardson name may be new to you, but its ideology is not...servicing the customer.

Broadcast Richardson has combined the technical, integration and consulting expertise of the recently acquired Broadcast Richmond with the wide product offering and unsurpassed service of Richardson Electronics.

Complementing its specialized, value-added services, Broadcast Richardson draws from its 200+ product lines to offer you true inter-product integration.

Broadcast Richardson is prepared to lead the way in the broadcast industry. Turn to us for your next component, equipment or system need!

- **Transmitter Components**
- **AM, FM, TV, HF Transmitters**
- **Studio Equipment**
- **Broadcast Systems**
- **Antennas**
- **Cable TV**
- **Microwave**
- **Satellite**
- **Webcasting**

Call Today!
800-348-5580

*More than 60 locations
worldwide to serve you.*

E-mail: broadcast@rell.com

Internet:
www.broadcast-richardson.com

630-208-2200
Fax: 630-208-2550

©2001 Richardson Electronics, Ltd. MK2189

A Featured Presentation...
From one of our 200 product lines!

RFCAST

AM Transmitters

Features Include:

- Identical and on-line hot plug-in amplifiers, fully protected
- Built in modulation monitor and audio processor (optional)
- Digital and AM stereo compatible
- Covers AM and extended AM band
- High accuracy synthesized oscillator
- Built-in remote control interface
- 24 month warranty



AT1K5 – 1 kW AM Solid State



AT7K5 – 5 kW AM Solid State

Competitively Priced For You!
In Stock. Call Today!

BROADCAST 
 **RICHARDSON**

Integrated Solutions

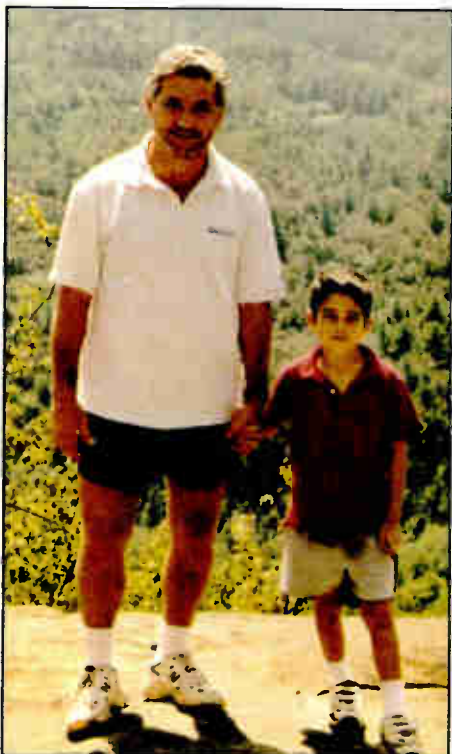
Online Classifieds: NTR Gold

Lisa M. Osborn

Why let the local newspaper continue to corner the market on classifieds? With the dot-gones and the economy stalling, now could be an ideal time for your station to develop a successful online classifieds program.

"There's been incredible growth in print classifieds over the last 20 years," said Mary Clark, director of strategic local initiatives for Clear Channel, "from \$4.2 billion in 1980 to \$19.5 billion in 2000, with the employment category seeing double digit growth more often than not," Clark said.

That's according to figures from the Newspaper Association of America,



Eric Strauss stands with his seven-year-old son Jacob on Mt. Jo at Lake Placid, N.Y.

which said employment represents 45 percent of overall print classifieds revenue and is the strongest print classifieds category.

Clear Channel is bullish on online classifieds. The company offers them on most of their station sites through a relationship with BuySellBid.com, which provides the technology and content behind the radio giant's cur-



Mark Hammerstrom With a Prospect at The NAB Radio Show in September

rent online classifieds initiative.

Clark believes the revenues will be there for broadcasters who get involved with online classifieds early on. It's easy to figure out how much opportunity is there: Just look through the classified section of the Sunday paper, count the ads, note the rates and do the math.

Clark is interested in employment classifieds for a few reasons. They offer multiple revenue streams such as job and résumé postings and they are immune to what's going on in the

economy.

Clark realized the revenue-generating opportunity of online classifieds through personal experience.

"I thought about how much money I'd spent myself on classifieds when looking for an account executive for business or a nanny for my children. Then I wondered how much money my neighbors were spending," Clark said.



Andrew Hammer

home to sale of the home," said Clark.

"Real estate and automotive are the two biggest buyers of classified ads in the newspaper," said Dave Casper, vice president of Internet services for the Radio Advertising Bureau. He urges stations interested in getting involved with classifieds to focus on a single class, such as employment/recruitment or real estate.

"Pick one category, get good at it and move on to the next. That's what a station should do with its Internet strategy in general," said Casper. "Focus on one or two things that make revenue, master them, then move onto something else."

Low cost

Start-up costs are minimal when partnering with an established online classifieds company, that will be able to deliver a site populated with ads virtually from day one. In order to be successful, a station should plan on devoting 20 to 30 60-second spots per week to drive traffic, according to companies contacted for this article.

Typically revenues are split, with the station generally keeping 45 percent to 70 percent of Net revenues.

"The biggest reason why (stations) should do this is because employment advertising is going to be a \$7.1 billion dollar business by 2005," said Andrew Hammer, manager of business

See ONLINE, page 37 ▶

Products & Services **SHOWCASE**



MAGER SYSTEMS, INC.
The Best in Sound Furniture

Since 1979 Mager Systems, Inc. has been designing and fabricating exquisite custom studio furniture for the broadcast industry nationwide. Our unique award winning furniture offers true solid wood premium construction, 3D drawings and design, delivery and installation. Of course, we still offer our 10 year warranty on solid surface tops exclusively, that will long out last wood edges and laminates. Our quality furniture is very affordable, and can accommodate every budget from economy to show-place. We know the broadcast industry is changing everyday, so, if you haven't looked at Mager Systems lately, its time you checked to see what we have new to offer like **Turnkey Prewiring**. Call us today and find out why Mager Systems is the best in sound furniture.



Does Your Studio Furniture Look As Great As This?

21602 N. Central Ave., Suite 1
Phoenix, Arizona 85024
TEL: 623-780-0045
FAX: 623-780-9860



Designed, Fabricated,
Delivered and Installed

www.magersystems.com
mager@magersystems.com

Online

► Continued from page 36

development for Canton, Ohio-based Top Echelon. Its product, the "Employment Classifieds" plug-in, can be integrated into a station's own Web site.

"It's a great opportunity for a radio station to go into a local market, where they're already focused, generate a new revenue stream and compete with the local newspaper," Hammer said.

This isn't a "get-rich-quick" scheme. Hammer provides an example of one Top Echelon TV-station client that generated \$70,000 in its first three months, but on average most Web sites make much less, in the hundreds or thousands of dollars per month range.

Revenues are tied directly to how much a site is promoted. Hammer said most sites aren't seeing a significant amount of revenue right now, but as rounds of layoffs continue, there's a reason for listeners to be visiting employment sites.

Package

Broadcasters should think of classifieds as a sales tool, which enable a station to develop attractive advertising programs, according to Hammer.

"A station can sell a package that includes online, radio and a remote broadcast in front of the store," said Hammer. "It's up to a station's staff to decide how creative they want to get."

The people behind Regional HelpWanted.com have taken a different approach. The employment site has had success building classifieds sites in medium-sized markets by directing listeners not to a station's Web site, but to the locally branded "YourTownHelpWanted.com" site.

Dick Orkin, whom the NAB recently announced will be inducted into the NAB Broadcasting Hall of Fame next April, produces "YourTownHelpWanted.com" commercials at his Radio Ranch. Each site is customized for its market. To hear example spots, visit www.regionalthelpwanted.com and click "How it works."

"We have nothing to do with a station's Web site," said Eric P. Straus, CEO and president of Regional-HelpWanted.com in Poughkeepsie, N.Y. "If (broadcasters) want to give us a link on their site, great, but we don't require it." Straus said that a jobseeker wants to visit the strongest brand rather than the local radio station Web site when looking for a job.

Although he said it's the hardest part of the job, Straus encourages competing stations to team up to promote the site to the community, share revenues and take a bite out of the newspaper's bottom line.

"If you care about making money, you should work with your competitors to help build the preeminent site in the market," Straus said.

"Newspapers have owned this monopoly for (a long time). We need to change employers' habits," said Straus. "Get them to transition from the newspaper to the Web. Great radio creative and strong reach and frequency can get that job done. Just not immediately."

Straus encourages stations to sign on for the long run.

"Our sites start to make a lot of

money after 9 to 15 months, but many broadcasters think if they can't get it done in a month or two, it ain't worth it," Straus said.

"They've had terrific results," said RAB's Casper about RegionalHelpWanted.com, "showing lots of return for their stations."

Interest is growing among station managers, according to Hammerstrom, who said more consumers are making the Internet the first place they start to look when shopping for a vehicle. Automotive classifieds site carsforsale.com arms account executives with marketing materials and research data to enable them to compete with newspapers for auto classified ad dollars.

"When I was a car dealer my newspaper sales rep was in my office every Monday morning," said Mark

Hammerstrom, chief executive officer of Minneapolis-based carsforsale.com.

"Signing on with carsforsale.com gives radio reps a reason to call on the local dealers, work face to face and become their marketing partners."

When a radio group partners with carsforsale.com, "The station in the market becomes carsforsale.com," said Hammerstrom. "That's where you get the local flavor of the site, which is much more competitive than the national sites."

Hammerstrom attributes his company's success to the fact that they aren't competing with the dealers.

"We are a lead generator for the dealers and enable them to track the results of their radio advertising."

Carsforsale.com stays away from providing financing options and after-

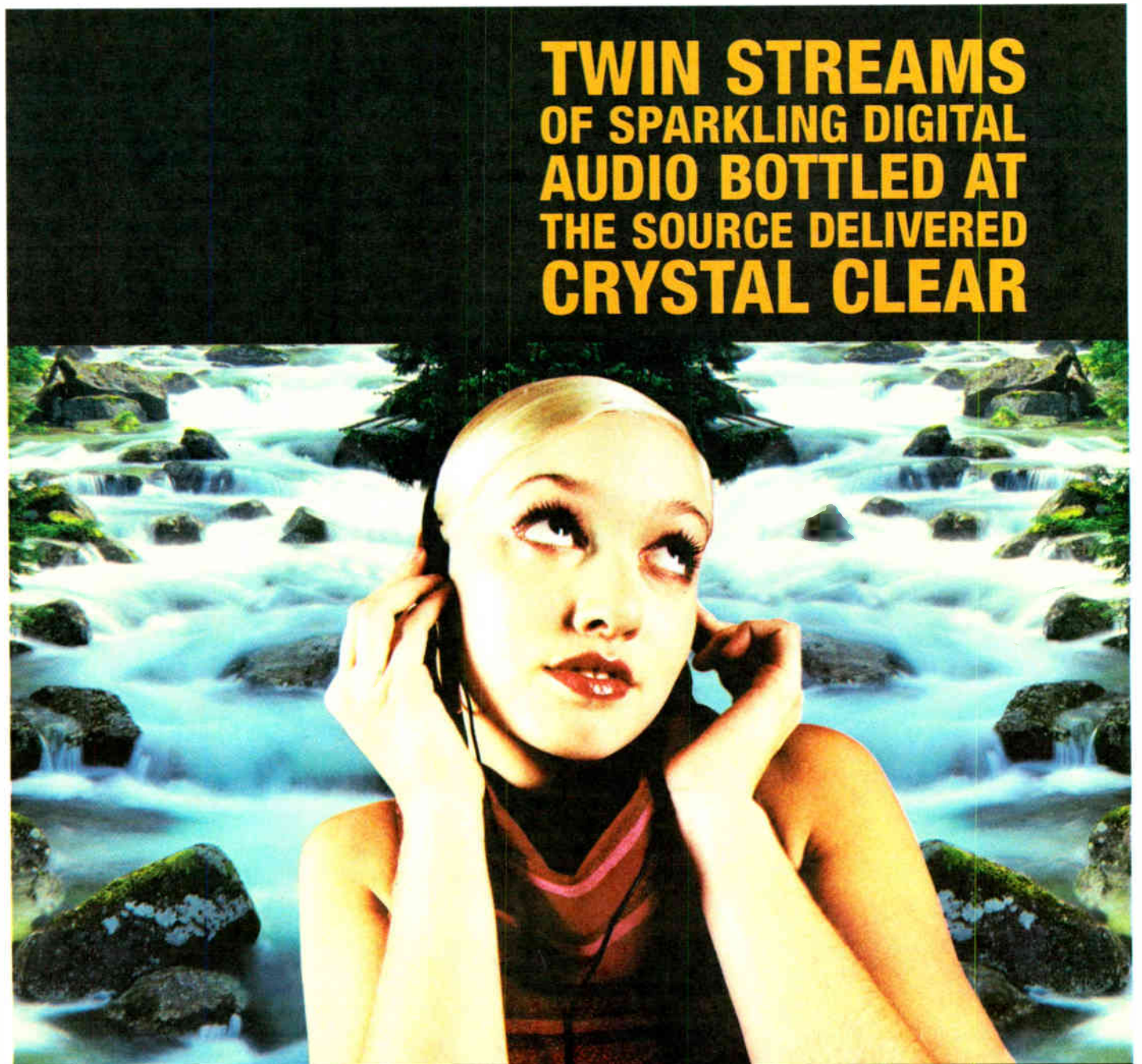
market accessories on their site because these have long been profit centers for dealers.

Stations that are dipping their toe in the online classifieds waters are finding, whether it's employment, real estate or automotive, now is an ideal time for radio broadcasters to devote energy to developing and promoting online classifieds for their stations.

"Revenue growth will be there online, said Clear Channel's Clark. Broadcasters putting a concerted effort into this space will be there to reap the rewards when the market becomes substantial, as will our advertisers. It's a joint venture at this point."

Lisa Osborn is a Los Angeles-based radio broadcaster.

Contact her via e-mail to InfoRadio@aol.com.



TWIN STREAMS OF SPARKLING DIGITAL AUDIO BOTTLED AT THE SOURCE DELIVERED CRYSTAL CLEAR

Moseley

You went all-digital and spent \$10K on a processor for a signature air sound, right? So the last thing you want to do is pollute the air chain with compression.

Demand the pristine 16-bit linear audio of the SL9003Q. It's configurable with up to two pairs of uncompressed stereo audio. You choose the sampling rate: 32, 44.1 or 48 kHz. Even add a cost effective T1 backup option with redundant audio modules, for still more versatility.

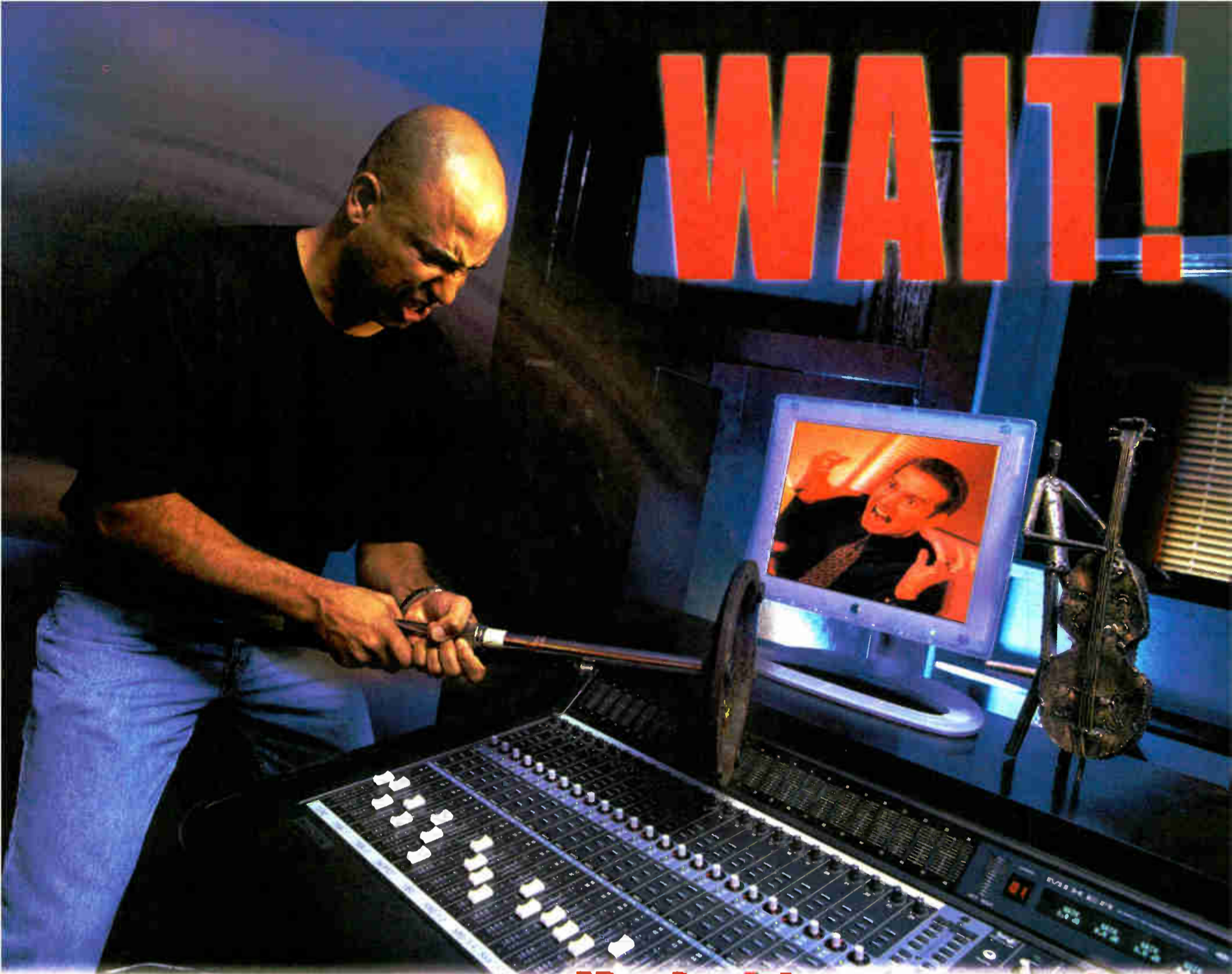
Dual, uncompressed AES streams – one STL – and the reliability and quality of Moseley.

The choice is clear.



phone (805) 968 9621 • 111 Castilian Drive • Santa Barbara, CA 93117-3093 • www.moseleysb.com

WAIT!



Maybe it's not your mixer

You know how impact and detail get lost through recording and mixing. And you just can't EQ, compress or mix the life back in. When you're at wit's end, the Aphex Model 204 can save your sanity.

The Model 204 renews and vitalizes your sound. The Aural Exciter® restores and improves definition and detail. At the same time the Optical Big Bottom® solidifies and strengthens the bass without hogging all the level.

If you need professional and impressive sound you owe it to yourself to get a Model 204. You'll probably save your sanity and a lot of perfectly good mixers. You've got a problem - We've got the solution!

The all new Aphex Model 204 Aural Exciter and Optical Big Bottom



APHEX
SYSTEMS

SOLUTION DELIVERY SERIES

11068 Randall Street, Sun Valley, CA 91352 U.S.A • 818-767-2929 Fax: 818-767-2641 www.aphex.com

Aphex, Aural Exciter and Big Bottom are registered trademarks of Aphex Systems • No mixers were harmed in the production of this ad.

PRODUCT EVALUATION

Harris Joins Small-Mixer Fray

Alan R. Peterson

Feature-laden mixers for broadcast and production need not be the size of a mechanic's creeper anymore; Greg Mackie proved that to the pro audio world a few years back with the now-classic model 1202 mixer.

More recently, the low-power FM movement has accelerated demand for affordable, small, high-performance broadcast equipment.

Small is good

Welcome to the age of the itty-bitty radio console, where diminutive designs such as the Autogram Mini-Mix 8A and the LPB Communications Blue 5C add important broadcast attributes and functions to the basic mini audio mixer.

Harris Corp. recently tossed a new competitor into the fray: the ProCast audio mixing console, a medium-duty mixer with broadcast features and functionality, all in an 18-inch-wide chassis that can be rackmounted if desired.

The obvious customers for this mixer include broadcast operations outfitting multiple studios on a budget, LPFM operators and academic institutions with broadcast curricula.

Arguably the most visible competitor in the mini-board arena right now is the LPB Blue 5C, so it seems appropriate to draw comparisons with that model.

The ProCast was OEM'd by Henry Engineering, the MatchBox people, as the BC12 console and carries the Harris name. Its metal construction, linear faders, off-white surface finish and wood-

en side "wings" give the ProCast a more traditional broadcast-like appearance than the hip blue case of its LPB counterpart.

When scaled down to this size, however, the ProCast more resembles a small theatrical lighting board than a broadcast mixer.

There are 12 inputs — three mics and nine stereo line ins — with a 13th fader controlling the studio monitor level. Each fader handles a single input, vs. the A/B inputs of the LPB 5C.

The ProCast has six main bus outputs on XLR connectors. Both the Program and Audition mix bus outputs are stereo. In addition, there is a Mono output, which can provide a mono mix of the Program or Audition output.

Insert jacks a nice touch

The microphone preamps are clean-running SSM2017 chips, and the back panel includes insert jacks on each mic input for patching in EQs or limiters. Nice touch.

The manual accompanying the ProCast suggests the use of dynamic or ribbon microphones rather than



The Harris ProCast Audio Mixing Console

powered condenser jobs. Curious wording, as I have not worked a ribbon mic at a station since 1988 and I

wonder who does at this point.

Microphone inputs have trimmer pots to set optimum preamp gain, while line inputs have sensitivity switches to handle pro or consumer levels. Both are tucked inside the rear panel, out of the way of prying jock fingertips.

The LED ladder VU meter runs horizontally. While I prefer a Mackie-ish LED meter that runs vertically (and there appears to be room on the chassis for it), jocks are accustomed to seeing a meter that swings left to right. Points to Henry and Harris for thinking like a jock.

Remote mic control

A tip of the hat also for the DB15 connector on the rear panel for remote mic control (on/off, cough and talk-back), LED mic status lights and a Mute Tally output line. Your newspaper person can remotely activate his or her mic from their booth or turret. A clear wiring diagram and remote control pinout is included in the manual.

See HARRIS, page 45 ▶

PRODUCT GUIDE

VXpocket Now Compatible With SoundCheck

The Digigram VXpocket laptop sound card now is compatible with the Listen Inc. SoundCheck electro-acoustic test system.

Distributed by Brüel & Kjær, SoundCheck is software for production line testing of loudspeakers, microphones and

other acoustic transducers.

VXpocket Version 2 for laptops lets SoundCheck users perform audio production and analysis on a mobile

platform. VXpocket has 24-bit converters. The card has two balanced mono inputs at microphone or line-level and two balanced analog outputs.

It has one stereo S/PDIF input and output that permits direct digital transfer and LTC (SMPTE) time-code input. A breakout cable is provided with XLR connectors for digital and LTC; a stereo minijack is included for headphone monitoring.

For more information contact Digigram in Virginia at (703) 875-9100, fax (703) 875-9161 or visit www.digigram.com.



Is running your production studio like controlling a nuclear reactor?

Simplify. Cool Edit Pro | The complete multitrack recording studio for Windows™

Up to 64 tracks • More than 40 DSP effects
DirectX™ Support • Crash recovery • Tons of file formats • Optional MP3 encoder/decoder

Download a demonstration version from www.cooledit.com
or call and we'll send a free demo/tutorial CD.

P.O. Box 62255
 Phoenix, AZ 85082 USA
www.syntrillium.com
 cepro@syntrillium.com

1-888-941-7100
 (toll-free sales, USA and Canada)
 tel: +1-480-941-4327
 fax: +1-480-941-8170

PRODUCT EVALUATION

Aphex: Big-Bottomed Excitement

Bruce Bartlett

Want to hear more-exciting sound in your station's spots or in your on-air signal? This processor from Aphex will do the job, and then some.

The Aphex 204 Aural Exciter increases articulation and clarity on the high end, while its Optical Big Bottom



enhances bass power and sustain on the low end — with only a small increase in signal level.

Aphex Systems has been making signal enhancers since 1975, and holds 20 patents on its technology.

The Aphex 204 can potentially benefit radio stations in several areas, particularly by adding some sparkle to muffled-sounding Webcasts. Spots may also sound more impressive both over the Internet and on air.

At clubs it can pump up disco music without damaging speakers.

Why not just turn up the bass and treble? Why not use a dynamic EQ or subharmonic synthesizer?

Aphex's processing is not the same thing, and it has several claimed advantages.

Aphex advantage

The 204 includes two effects: Aural Exciter and Big Bottom. Your signal enters the 204 and splits into three paths: straight through to the output, through the Aural Exciter sidechain, and through the Big Bottom sidechain (Fig. 1). The sidechains signals mix with the unprocessed signal at the 204 output.

The Aural Exciter performs

high-pass filtering on the signal, adds harmonics and frequency-dependent phase shift and mixes the processed sound at a low level with the original signal.

This processing is applied to low-level transients as well, a feature called the Transient Discriminate Harmonics Generator.

High-level sinusoidal waveforms are unprocessed to prevent overload. According to the manufacturer, the Aural Exciter increases the sense of presence, clarity, detail and loudness without significantly

high frequencies can add hiss as well.

The Big Bottom sidechain low-pass filters the signal, tweaks the phase vs. frequency and decreases the peak-to-average ratio (crest factor). The processed signal is mixed internally with the dry signal. Claimed advantages are enhanced bass punch and power with little increase in peak output.

Low frequencies in the sidechain are delayed and added to the original sound, which makes the bass notes last longer. Paradoxically, this does not change the original time relationship between the low frequencies and their harmonics, so there is no loss of low-frequency definition. Almost like Dolby noise reduction, low boost is

generate signals an octave below the lowest frequency in the input signal. These ultra-deep lows require more amplifier power and can cause overexcursion in woofers.

In short, the Aphex 204 adds brilliance and bass power without clipping your transmitter, amps or speakers.

Features and hookup

When I unpacked the Aphex 204, I was impressed by its heavy, rugged construction and elegant appearance.

It is a two-channel device that can process stereo signals. The channel controls are not ganged. Filling a single rack space, the 204 includes six control knobs per channel on a matte silver front panel. Three knobs affect the Aural Exciter and three affect the

outputs. The jacks are wired TRS and can handle unbalanced or balanced signals. A +4/-10 level switch lets the unit work with either operating level.

The Big Bottom controls have Tune, Drive and Mix functions.

Tune varies the bass enhancement frequency band from 50 Hz to 190 Hz. The best setting depends on your sound system and type of music.

Drive sets optimum signal level according to a flashing LED.

Mix adjusts the amount of enhancement added to the original signal.

The Aural Exciter controls — Tune, Harmonics and Mix — work similarly.

Tune varies the corner frequency of the highpass filter, which sets the range of enhanced frequencies. Range is 800 Hz to 6 kHz, 3 kHz nominal.

Harmonics adjusts the level of harmonics or "edge" added to the signal.

Enhancement varies

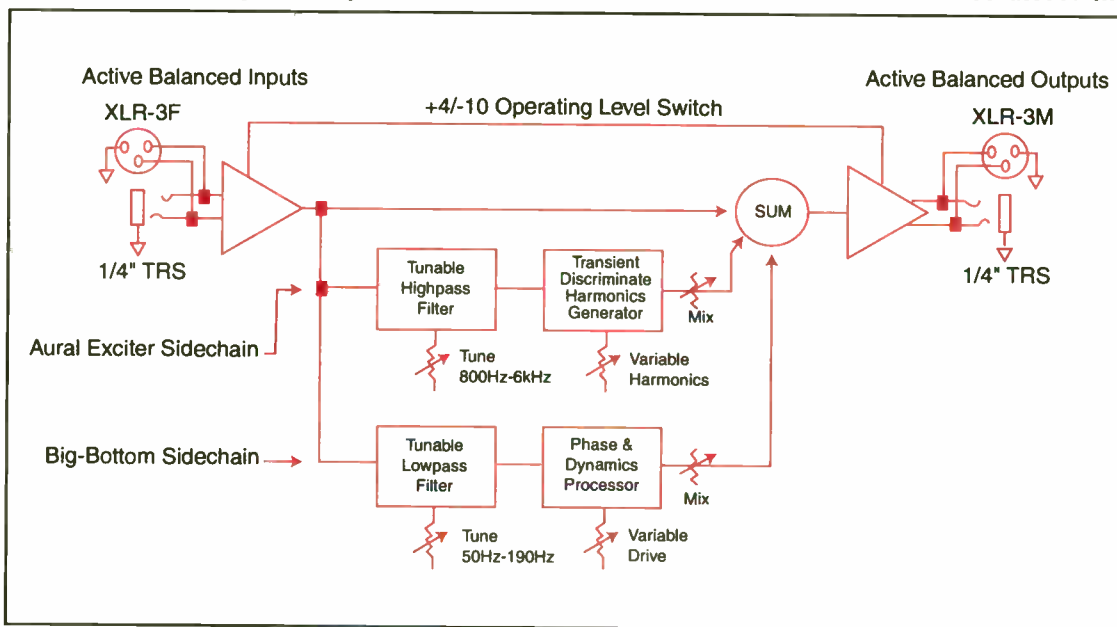
Mix varies the amount of enhancement mixed with the original signal, like a dry/wet mix control on a reverb unit.

Normally you patch the Aphex 204 in line with the signal you want to process. Connect it between a tape track and a mixer, or between the air console and transmitter. Or connect the 204 between a channel's send/return insert jacks.

If the mix controls on the 204 are set full clockwise, the unit will work in an effects loop, but that is not the recommended way of using it.

The manual that comes with the 204 is as good as it gets. Clear, thorough and attractive, the manual has helpful sections on applications, balanced/unbalanced lines, hum and grounding, and interconnection techniques.

Aphex recommends setting
See APHEX, page 47 ▶



The signal enters the Aphex 204 and splits into three paths.

raising the signal level, and extends the high frequencies.

In contrast, enhancers with dynamic EQ boost the highs when the signal exceeds a certain threshold. But if the signal level is already high, this boost might overload power amps or speakers. Amplified

applied to low-level signals, but not to high-level signals.

In contrast, bass enhancers with dynamic EQ boost the bass notes that exceed a threshold. Again, this boost can overload amps and speakers if the signal level is high. Subharmonic synthesizers

Big Bottom.

Nominal settings for the controls are straight up — a thoughtful touch. Also on the front are two effects bypass switches, a power switch, and level indicators.

On the rear panel are XLR and phone-jack inputs and

AEQ eagle
ISDN AUDIO CODEC

THE AFFORDABLE POWER

ONLY!
\$ 2,795
manufacturer's price

AEQ eagle
ISDN AUDIO CODEC



- Dual channel audiocodec.
- Analogue and Digital Inputs / Outputs.
- Unique multiplexing capabilities.
- The E@sy control Bus features IP Remote Control capability.
- Offers easy to use monitoring capability on the front panel.

AEQ Broadcast International Inc. 2660 S.W. 87 Avenue Davie, Fort Lauderdale, Florida 33328

Phone: (954) 424-0203 Fax: (954) 424-0902 email: aeqamerica@aol.com

VISIT US AT: www.aeqbroadcast.com

Rave Reviews!

"Excellent Product" — Doug Walker, Clear Channel, Cincinnati

"Telos has taken two great products [the Zephyr and the Zephyr Express] and made them better. They listened to the customer." — Raul Velez KNBR, KFOG, Susquehanna Broadcasting of San Francisco

"Telos asked us what we wanted and they put it in there... you can't ask for anything more than that." — Paul Burt, Clear Channel, New Orleans

"It's even easier to use than the original Zephyr." — Michael Black, WEOS, Geneva, New York (NPR affiliate station)

"The most popular ISDN digital transceiver in the country has a fresh new look... Zephyr Xstream, a slick, updated version of [the] familiar Zephyr." — Steve Kirsch, Silver Lake Audio, New York

Telos
www.zephyr.com



PRODUCT GUIDE

Trans-ana Circuitry Provides Broadcast Clarity

Hafler's new TA100 and TA1600 two-channel, two-rackspace convection-cooled power amplifiers are suitable for numerous applications at entry-level prices.

The circuitry used in the TA1600 is

a refinement of the Hafler trans-nova circuit. Hafler says the circuit's natural sound and realistic reproduction are suitable for critical installations.

The TA 1100's trans-ana circuitry provides clarity and intelligibility to

broadcast facilities and headphone monitoring installations. Even at low power levels, Hafler says, the trans-ana MOSFET amp circuit imitates the accuracy and warmth of the TA1600.

Other features of the amps include soft start circuits, thermal sensing network and LED indicators to provide a visual representation of the operating status of each channel.

Price: TA1100 (100 W): \$249; TA1600 (150 W): \$379.

For more information contact Hafler in Arizona at (480) 517-3056, fax (480) 894-1528 or visit www.hafler.com.



Broadcast stations worldwide cut power tube replacement costs by half.

So can you.

DM ¥ ¢ SRIs Q \$ Sk W KD € £ NT\$ R\$



ECONCO

1318 Commerce Avenue
Woodland, CA 95776
(530) 662-7553 International
(800) 532-6626 Toll Free
(530) 666-7760 Fax

www.econco.com

POWER TUBES REBUILT BY ECONCO

Our tubes are about half the price of new. Plus, ECONCO rebuilt tubes often last longer than new tubes making them an easy choice.

SUPERB WARRANTY

Unconditional hassle-free 3,000 hour warranty.
Starts when tube is put in service.

BANK TUBES WITH US AT NO CHARGE

We rebuild at no cost to you!
We maintain your rebuilt tubes in our inventory and invoice only when shipped.
Same day shipping when you call.

ECONCO—The recognized leader in rebuilt power tubes.

Jensen Releases Updated Sourcebook

Jensen Tools has released its fall 2001 Master Sourcebook. The 300-page catalog contains thousands of products, including more than 400 new items. The company designs and distributes tools and test equipment to the electronics service industry.

For a free copy of the sourcebook call (800) 426-1194 or (602) 453-3169, e-mail jensen@stanley-works.com or visit the company Web site at www.jensentools.com.



Software Switch Displays Variety

A new series of software-controlled pushbutton switches from NKK, the IS series SmartSwitch, can be programmed to display a variety of text, still images or moving images.

When grouped together, the switches are capable of displaying sequential information.



Good for "black box" users who build and customize their own equipment, the SmartSwitch can communicate operating function, status or warning.

Uses include control panels for communications systems and audio and video broadcast workstations. The switches can be mounted side by side vertically or horizontally. Bi-color LED illumination includes red/green, blue/red and yellow/blue. Resolution is 36x24 pixels, permitting viewing in high- or low-light conditions. The switches are software-upgradeable. Price: \$27 each in quantities of 1,000.

For more information contact NKK Switches in Arizona at (480) 991-0942, fax (480) 998-1435 or visit www.nkkswitches.com.

How to Make Sense of Decibels

Blažo Guzina

I once dropped in on the technical facilities of a big company in Belgrade, where I noticed two young men in front of the biggest monitor of the best PC I had ever seen.

A plethora of colorful fields floated over the monitor, showing custom software for a complex calculation of electrical units. Just as they were about to present what they probably believed was a software masterpiece, I noticed that the fields in an entire column were denominated as "Db."

They said it was the symbol for a decibel. When I corrected them, saying it should be written "dB," their enthusiasm plummeted and they dejectedly started to rewrite the software.

Useful unit

The decibel may be the unit of measure most frequently used in acoustics and audio techniques and in electrical engineering in general.

For instance, in acoustics alone, there are four types of decibel for the measurement of sound levels — dB(A), dB(B), dB(C) and dB(D) — with a fifth, dB(N), used for aircraft and other noises, and still more in audio and electrical engineering.

What is the decibel?

It is a useful unit for measurement of changes in sound intensity or ratios of electrical quantities. Modern-day engineering requires accurate measurements over wide dynamic ranges.

Because the graphical presentation of the measured results to linear scales often is impractical, a useful solution is to present data in terms of logarithmic scales, usually the decibel (dB) scale.

Knowing that, according to the Weber-Fechner law, the human ear hears in a logarithmic fashion, we can understand that decibels complement

this scale.

A *decibel* is one-tenth of a *bel* — a unit for comparing two currents, voltages or power levels, as well as for measuring the intensity of a sound. It is named after Alexander Graham Bell, inventor of the telephone.

The sound pressure level of any given sound is 20 times the logarithm of the ratio of the measured sound pressure of this sound to a reference sound pressure. The unit for pressure is a pascal (Pa), with the old unit, micro-

It takes some 10,000 times more acoustic power to enable humans to hear a 20-Hz pure tone than it does to hear a 4-kHz tone.

bar (μb), still often seen. Their relationship is: $1 \text{ Pa} = 10 \mu\text{b}$.

The intensity level of a sound, in decibels, is 10 times the logarithm of the ratio of the intensity of this sound to a reference intensity level.

The decibel always is related to some reference value or the zero level. In the case of sound pressure level, it is a pressure of $p_0 = 2 \times 10^{-5} \text{ Pa}$ or $p_0 = 2 \times 10^{-4} \mu\text{b}$, corresponding to the threshold of hearing of a human ear at a frequency of 1 kHz.

According to the above definitions, doubling/halving a voltage, sound pressure or any quantity of first degree (volts, amperes) produces a 6 dB increase/decrease. With power, energy

level, intensity level, energy intensity level or any quantity of a second degree (watts), doubling/halving produces a 3 dB increase/decrease.

Human ears do not hear in a linear manner. At the normal threshold of hearing (0 dB SPL), it takes some 10,000 times more acoustic power to enable humans to hear a 20-Hz pure tone than it does to hear a 4-kHz tone.

Point of reference

Dynamic range — the difference in dBs between the loudest and the quietest sound intensity that the ear can detect — is spread between the threshold of hearing and the threshold of feeling (120 dB at 1 kHz).

Neither threshold curve is linear in the range of audible frequencies. This is a reason another unit, different from the dB, was introduced for perceived loudness: the *phon*.

It is possible to calculate loudness in phons from actual sound volume by using a standard set of curves representing average human hearing.

Because loudness (a subjective quality) and the measurable volume of sound are not the same thing, it was convenient to introduce some kind of a reference, considering them as being the same at 1 kHz. By definition, a phon equals a decibel at 1 kHz.

In audio technique, you will see the following decibels used:

- dB, used alone as reference for level changes
- dB SPL, the ratio of sound pressures referred to $20 \mu\text{Pa}$, corresponding to the threshold of hearing of the human ear
- dBV, ratio of volts referred to 1 V
- dBu, ratio of volts referred to 0.7746 V
- dBm, ratio of watts referred to 1 mW
- dBW, ratio of watts referred to 1 W

Another area of decibel measurement is that of operating levels. Operating levels — the average



The decibel takes its name from Alexander Graham Bell, inventor of the telephone.

(power) levels at which signal-carrying wires operate — usually are divided into three categories: microphone level, line level and loudspeaker level.

Microphone level ranges from -90 dBm (1 pW) to -30 dBm (1 μW). Line level ranges from -30 dBm (1 μW) to +30 dBm (1 W). And loudspeaker level is from line level or higher, audible from a loudspeaker.

Finally, decibels are also used to express nominal operating level, headroom and noise floor.

Nominal operating level is the design target signal level of audio circuits. If an audio device has to work with a nominal operating level of +4 dBu and its noise floor is -80 dBu, with a maximum output voltage of +24 dBu, then the nominal operating signal level will be 84 dB higher than the noise, allowing for 20 dB of headroom.

Blažo Guzina is a senior engineer in the technical development department of Radio Televizija Srbije (RTS) in Belgrade, Yugoslavia. He is the author of *Uvod u tehniku snimanja zvuka (Sound Recording Technique)*, ISBN 8683279022.

Contact him via e-mail to blažo_guzina@yahoo.com.

PRODUCT GUIDE

dbm Protects Audio Cards

Shield your expensive audio cards with new AudioSurge protection from dbm Systems.

A lightning strike or power surge can destroy professional digital audio cards, some costing over \$2,000, in less than a second.

AudioSurge transient voltage suppressors are designed to help protect high-end, professional and broadcast audio gear from damaging transients.

The company says AudioSurge offers near-instantaneous response time of 1 picosecond, with immediate peak power dissipation of up to 1,500 watts. Models are available for most popular high-end digital audio cards, and dbm can make custom suppressors for other



audio and control applications.

Prices start at \$49.95 depending on configuration.

For information, contact dbm systems in Mississippi at (800) 795-RADIO or (601) 856-9080 or visit the company Web site at www.audio-surge.net.

Not Real...



- 24-bit/192kHz Analog I/O
- 32-Channel Digital Mixer
- ADAT and TDIF Support
- SMPTE Time Code I/O
- Video Genlock

...Unreal

External converter performance - now available without the box!

Lynx TWO World's first 192 kHz Multichannel Sound Card

Acclaimed conversion technology, extensive synchronization capabilities, reliable drivers for Windows and Macintosh

More details available at www.lynxstudio.com

Lynx Studio Technology • email: sales@lynxstudio.com • ph. (949) 515-8265

Products & Services SHOWCASE

SIX MILLION THUNDERSTORMS HIT PLANET EARTH EVERY YEAR! IT TAKES ONLY ONE TO PUT YOU OFF THE AIR!



The STATI-CAT LIGHTNING PREVENTION SYSTEM provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8" stainless steel rods.

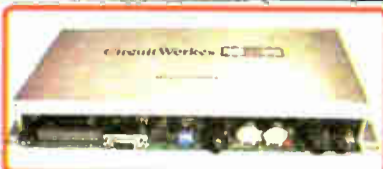
This affordable and rugged system has proven itself in the field for over 15 years.

Cortana
Corporation Inc.

Write or call for a free brochure and design
P.O. Box 2548, Farmington, N.M. 87499-2548
Toll Free Ph: 888-325-5336 • Fax: 505-326-2337

Embedded Control Over Audio

Easily control network local inserts or Internet streaming!



The **SEN-6** is a single channel Subaudible tone encoder with integral audio filtering that can produce 25Hz, 35Hz and combination tones from external closures.

Cool Problem Solver!

- Encodes 25, 35 & 25/35 combination tones (can also generate 50 & 75Hz or 19 & 27Hz).
- Tunable notch filters remove subaudible content from program material prior to tone insertion.
- Jumper-set precise tone duration.
- Model SEN-6 List Price only \$399.00

*50 & 75 Hz tones may require external input filtering to avoid false tripping.

(352) 335-6555 <http://www.circuitwerkes.com>

CIRCUITWERKES, INC. - SERVING BROADCASTING SINCE 1990

DIGITAL ANTENNA MONITORS

In-Stock-Available for Immediate Delivery



Price US\$2700.00 2 Towers
Will operate with any remote control equipment.



Price US\$2100.00 2 Towers
For AM directionals with studio located at transmitter site.

These monitors are state-of-the-art instruments of unequalled accuracy (.5% or better on ratio and .5° or better on phase) and stability. With typical modulation the true ratio readout of these monitors is a factor of 10 more stable than instruments that measure normalized amplitude, and their phase readouts are rock solid. Phase sign is automatic, no extra operation. In addition to the analog DC outputs for remote control the Model CMR has a multiplexed BCD digital output which can be used to drive the Remote Indicator Model CMR-1. RF inputs have dual protection. Gas discharge tubes across the sample line terminations plus relay protection.

GORMAN REDLICH MFG. CO.
257 W. Union St. Athens, Ohio 45701
Phone 740-593-3150 • FAX 740-592-3898
www.gorman-redlich.com/jimg@gorman-redlich.com

Import/Export .wav Anywhere On Your Network.

VoxPro™



World's Quickest, Easiest Phone Editor

206.842.5202 www.audionlabs.com

NEW

"Headphone Echo" driving your DJ



Use **MoniSwitch** to eliminate it!

MoniSwitch is a special audio switcher that automatically switches the DJ's headphones from "air" to "local" when the mic is on. Those weird echoes and flanging effects are gone!

Quick and easy installation...

only \$195!

MoniSwitch is IN STOCK at all Henry Engineering dealers.



For detailed info, visit www.henryeng.com Tel: 626.355.3116 Fax: 626.355.0077

NANOAMP SERIES™ Problem Solvers DIGITAL MATCHMAKER™



• LEVEL AND IMPEDANCE CONVERTER • FIELD OR STUDIO USE • COMPACT • DESK OR RACK MOUNT KITS

- AES/EBU Signals
- Sample Rates 27 to 96kHz, 24 bit
- XLR, RCA or BNC, or TOSLINK™ Inputs
- Simultaneous Digital XLR, RCA or BNC and TOSLINK™ Outputs
- Transformer Isolated

DMM 100
• UL & CE 24VDC remote power supply

DMM 100-BAT
• 4 AA Battery Powered, or remote power supply

Free Brochure Available Upon Request
<http://www.atiguys.com>

328 W. Maple Avenue • Horsham, PA 19044
800-959-0307 • 215-443-0330 • Fax: 215-443-0394

ATI AUDIO TECHNOLOGIES INCORPORATED

Efficient

Effective

Affordable

RADIO WORLD'S Products and Services Showcase provides a perfect medium for marketing your products and services.

For more information, contact your sales representative or Simone Fewell at 703-998-7600, ext. 154 to request a media kit.

Radio World

Harris

► Continued from page 39

A separate "booth feed" provides a headphone mix (with IFB) to your news talent. The console operator can switch the Booth feed so it either "follows" the Monitor system, or is dedicated to the Audition bus.

I should note the LPB Blue 5C also has two headphone jacks, each individually adjustable and able to independently monitor program or cue busses. But the 5C was laid out with the assumption that two announcers would be in the same space. The ProCast designers included a duplex talkback system, assuming studio-to-studio communication might be necessary.

Pull the panel

The ProCast innards contain a mix of discrete and surface-mount components and socketed ICs. Two circuit boards — one supporting the faders and one handling I/O — are joined by ribbon connectors.

An external power supply drives the ProCast. Do not expect to power the mixer with a plain vanilla wallwart should the main power unit fail.

The ProCast isn't a modular console, but can be serviced in the field, albeit with some effort.

Unscrewing the bottom plate provides access to the SSM2017 and 5532 chips. The components most commonly prone to failure and replacement — rotary pots, switches and faders — are obscured by the PC board.

Henry Engineering notes that gaining access to the faders takes no more than 15 minutes, but still requires disassembly of the ProCast. It is doable, but I wish there were a simpler repair method. And in all fairness, the LPB Blue 5C is equally resistant to field repair.

An unfortunate reality about small

mixers today — broadcast or otherwise — is that they are difficult to service by the end user. Such is the trade-off with most inexpensive electronics today — the advantage of fast assembly sometimes sacrifices easy serviceability.

Music store-grade "hip-hop" turntable mixers have field-replaceable faders built to be swapped out in case of failure. It seems odd that semi-pro disco units and not the ProCast should be the ones designed for this.

Fortunately, swapping over to an unused input on the ProCast is easy, should a fader fail. Just pull the quarter-inch plugs and move them over to an unused input.

And to Henry's credit, the ProCast is shipped with an emergency spare parts kit which includes a replacement fader, a rotary pot and a few pushbutton switches.

Harris squeezed telephone capabilities into the ProCast, adding a mix-minus bus and accompanying XLR Send plug to the back panel. Any input set for Program becomes part of the mix-minus feed except for Line Channel No. 4, which is the dedicated phone hybrid input.

While simplifying how a caller gets on the air live, the hard-wired bus does not allow off-air recording of a phone caller via Audition while another event is playing — program material also gets recorded. A Utility bus would have come to the rescue here.

A clever cluster of buttons allows a number of monitoring and meter options, including monitor dimming, off-air monitoring via an external receiver and a Cue/Program blend called "QMIX," allowing cue channel monitoring through the Right Program speaker instead of the typically tiny cue speaker.

The Prog/Aud/Cue pushbuttons and the mic keys concern me as feeling lightweight and perhaps not up to the rigors of long-term switching. But

except for the mics, the tendency is to simply turn down a particular fader to kill that channel, rather than strike buttons.

There is a row of momentary contact SPST buttons beneath the stereo faders, meant for remote activation of external equipment. These differ from the Blue 5C, which provides constant closure as long as a channel switch is active.

The clever engineer can construct a black box that offers latching or momentary closures, or simply purchase a Henry Engineering LogiConverter to accomplish this.

Audio specs are typical for a small mixer. Frequency response levels off at 15 kHz, which is fine for a small FM operation and absolutely stellar for an AM operation. Some may snort at a cutoff below 20 kHz, but nobody will ever hear that extra 5 kHz over the air.

Other published specs indicate crosstalk at 65 dB at 1 kHz, and 0.02 percent total harmonic distortion and intermod at nominal output level.

Keep a couple of SSM2017 chips handy in your parts inventory. According to the Analog Devices Web site, the IC manufacturer considers the component obsolete and recommends the newer AMP 02 as a replacement. Another alternative is the 1510 IC, an improved version of the SSM2017, from That Corp.

Screen legend

Finally, some legends persist forever, but I don't know about the legends screened onto the control surface. As I have observed before, some expensive consoles can lose their paint job from normal use in very short periods.

As I only had the ProCast for less than a month, it was not possible to check the screening for durability. A nice Lexan coating over the top surface as a precaution might add to the longevity of the mixer.

There will always be compromises when going the small-mixer route. Make

Product Capsule: Harris/Henry Engineering ProCast Broadcast Console

Thumbs Up

- ✓ Styled as a traditional broadcast console
- ✓ 12 inputs, 6 outputs
- ✓ Multiple remote and monitoring capabilities
- ✓ Input level options easy to change
- ✓ Backed by Harris Corp.

Thumbs Down

- ✓ Difficult to service faders
- ✓ Buttons do not feel durable

Price: \$1,999

For more information contact Harris Corp. in Ohio at (800) 622-0022 or visit the Web site at www.broadcast.harris.com.

sure the features of one console over another are the ones you need and that you can live within the limitations therein.

Final analysis

Right now, the ProCast has the advantage being more "serious" than the Blue 5C does, and it offers numerous monitoring and remote options that puts it on par with bigger boards. The drawbacks are its serviceability and moderate-duty pushbuttons.

But at \$1,999, I suppose it is possible to afford two mixers and keep one in the crate as a backup unit while the other is off being worked on.

LPB Communications is poised to release a line of add-ons for its Blue 5C mixer, including a relay interface for momentary or sustained closures, and a multiple input switcher to enhance the mixer's versatility.

If Harris follows suit and similarly supports the ProCast with add-ons suggested by users, it will be a contender.

Alan Peterson has also reviewed the Autogram and LPB mixers mentioned in this article. Contact him at alanpeterson@earthlink.net.

PRODUCT GUIDE

Dream Satellite DAW Fast and Affordable

The Fairlight Dream Satellite digital audio workstation with the proprietary QDC processing system outperforms many other DAWs in raw speed, according to the company.

The DAW's editing model, Binnacle, presents key editing functions in a layout centered around a jog wheel. Layering work, razor-type editing, copy, cut, erase, trim, slip, fade and other functions are accessible randomly.



Fairlight Binnacle Editing Model

The system's open architecture is designed for expansion, with mixing facilities and support for third-party plug-ins planned.

The Satellite has 96-Hz/24-bit audio quality. The Dream Satellite is offered in 16-, 32- and 48-track configurations, with a choice of analog and/or digital I/O. It is compatible with both QDC-based and MFX3plus-based formats. Price: from \$37,000.

For more information contact Fairlight in California at (323) 465-0070, fax (323) 465-0080 or visit the company at www.fairlightesp.com.au.

The Wizard™ has gone STEREO!

The new DIGITAL FMSA-1 gives The Wizard System unmatched stereo monitoring capabilities. . .



Superlative stereo performance. Linear-phase filters that reveal the true performance of your audio processing. The stability of digital stereo demodulation. The sophisticated graphical presentation of The Wizard. And—with the RS-232 port—operation on site or off.

Contact Belar today for more details on what should be your next modulation monitor

BELAR ELECTRONICS LABORATORY, INC.
118 LANCASTER AVENUE • P.O. BOX 76 • DEVON, PA 19333-0076 USA
(610) 687-5550 • FAX (610) 687-2686
Call, write or FAX for more information on Belar AM, FM, Stereo, SCA, and TV monitors.
www.belar.com

Products & Services SHOWCASE

Remote tools

Designed by broadcast engineers for broadcasters, our flexible line of remote access and control equipment gives you elegantly functional solutions to your control requirements without the need for "custom boxes".



DC-8A Dial-Up Remote Control
Controls and monitors 8 external devices from any touch-tone telephone with extremely flexible programmable features.



PSC Programmable Schedule Controller
Stores and controls up to 160 events with Hour/Minutes/Seconds, Day/Month/Year, or Day of Week with Daylight Savings Time correction. 20 SPST relays and/or 32 serial custom commands provided.



MSO-8 Control Panel
Provides a convenient way to add front panel control to our smaller profile products with eight LED-indicator-equipped switches.



SRC-1616L Serial Remote Control
Equipped with 16 opto-isolated and CMOS/TTL compatible inputs and 16-Relay (Form C) outputs that may be controlled from a host computer, or a pair of units can be used in a stand-alone configuration (relay extension cord).



MC-16 Telephone Hybrid/Coupler
Full featured telephone line coupler/hybrid provides 32 programs; 32 ASCII strings (DTMF to ASCII); 64 macros; 16 relays; auto answer; 4-digit access codes and much more.



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).



SSM Smart Silence Monitor
Monitors any stereo or two independent monaural sources and generates alarms indicating loss of carrier when white noise and/or silence is detected.



UI-4II Universal Interface
Perfect for adding logic functions to mechanical switches/relays, adding remote functions to transmitter control/logic, detecting phone line "ring", etc.

Check out our web site for product information, list pricing and a list of distributors!

Internet: www.broadcasttools.com E-mail: bti@broadcasttools.com

Voice: 360 . 854 . 9559
Fax: 360 . 854 . 9479

**BROADCAST
tools inc.**
Innovative Problem Solving Tool For Broadcast

ERI ELECTRONICS RESEARCH, INC.

SHPX Series FM Antenna



For single or multiple frequencies
15 Mhz duplex bandwidth
120 kw input power rating

Accept No Imitations!

www.ERInc.com

812-925-6000

Designed for Broadcasting! MINI-MIX 8A



**\$2499
List**

12 Stereo Inputs 2 Stereo Outputs
2 Dedicated Mikes 1 Mono Output

Service & Affordable Quality for Over 28 Years

**AUTOGRAM
CORPORATION**

1500 Capital Avenue (972) 424-8585
Plano Texas 75074-8118 1-800-327-6901
FAX (972) 423-6334
info@autogramcorp.com



The RF People

Silicon Valley POWER AMPLIFIERS

Our growing product line
SATISFACTION GUARANTEED !!

B-150A
up to 165w
B-300A
up to 330w

B-450
up to 500w
B-600
up to 630w

10/1000
10 watts in, 1000w out

B-850
up to 930w
B-1000
up to 1200w

B-1500
up to 1750w
B-2000
up to 2.2kw

10/3000
10 watts in, 3kw out

Phone:- (408) 986 9700

Fax:- (408) 986 1438

e-mail:- sales@svpa.com

Website:- www.svpa.com

Design
Manufacture
Install

intelligent ergonomic designs
elegant and durable
full array of finishes
flush mounted consoles
computer accommodations
standard EIA rackrail included
rear access to equipment
convection or assisted cooling
all cabling fully concealed
cabling fully accessible
4 week leadtime

visit our website soon

Without Advertising
A Terrible Thing Happens...



...NOTHING

Place your ad here and reach
key broadcast professionals
with purchasing power.

Call your area sales representative
or Simone Fewell @
703-998-7600 ext. 154
to request a media kit.

WOODLINE FURNITURE

serving the broadcast industry with quality furnishings

www.woodlinefurniture.com

Phone: (616) 261-9600

Aphex

► Continued from page 40

the Aural Exciter and Big Bottom effects separately. Start with the mix control turned up to make the effect obvious, then back off to a tasteful amount of processing. As they say, "A little Aural Exciter goes a long way."

I played several CD tracks through the 204 set to its nominal settings and listened for the difference with the effects switched in and out. Generally I heard more bass, deeper bass, and slightly brighter highs. How quickly the ear adapts to this! When I bypassed the 204, CD tracks that formerly sounded okay became thin, dull and lifeless by comparison.

bass notes if desired.

Similarly, I compared the Aural Exciter with a mixer EQ boost at 12 kHz. Adding EQ raised the mixer level

ed airy and crisp without being harsh, unlike the 12 kHz shelving boost.

The Aphex processing sounded something like a selective, narrow-band

gram, I rolled off frequencies below 60 Hz and above 6 kHz using my mixer's EQ. Then I put the equalized program through the 204 and converted it to a Real Audio file. The resulting file sounded fuller and brighter than the same file without processing.

Finally I tried the 204 on a portable disco system with moderate-size speakers. It sounded like I added a subwoofer! The bass became louder and deeper, even at quiet volumes.

The Aphex 204 is a solidly built, good-looking unit that can enhance the sound of various productions in your studio. It can even beef up your station's on-air signal.

Great job, Aphex.

Recording engineer Bruce Bartlett says his bottom is big enough already, thanks. 🎧

The Aphex 204 is a solidly built, good-looking unit that can enhance the sound of various productions in your studio.

about 5 dB, while the Aural Exciter raised the mixer level only 1 dB. Because I could tune the Aural Exciter to affect only the extreme top, it sound-

EQ, but without ringing or peakiness.

Next, I wanted to see how the 204 might enhance the sound of a Webcast. Starting with a full-range musical pro-

Product Capsule:
Aphex 204
Aural Exciter

Thumbs Up

- ✓ Versatile tonal enhancement
- ✓ Sounds better than EQ
- ✓ Doesn't cause clipping as other processors can
- ✓ Solid construction

Thumbs Down

- ✓ May be easy to overuse (remember, a little goes a long way)

Price: \$399

For more information contact Aphex Systems in California at (818) 767-2929, fax (818) 767-2641 or visit www.aphex.com

It was fascinating to compare the Aphex processing with standard EQ. First I listened to a musical signal with the Big Bottom effect in its nominal setting. Then I ran the same signal through my mixer, and boosted 80 Hz until I heard the same bass boost that Big Bottom provided.

The EQ made the mixer meters peak about 6 dB higher, but Big Bottom raised the peak level only 1 or 2 dB. So, using the Aphex 204, you can get a fuller, stronger sound on the air without overmodulating the transmitter. The Big Bottom effect sounded less bloated than the EQ. The 204's Tune control let me affect only the deepest

25th Anniversary Silver Sweepstakes

Enter to win one of 25 great prizes in Radio World's reader appreciation contest giveaway!

IMAS Publishing is celebrating 25 years of serving you and the radio broadcast industry. To mark this significant milestone, 25 of radio's leading equipment suppliers have teamed up with Radio World to express their appreciation. Throughout 2001, Radio World will conduct 25 random drawings. Prizes and winners will be announced in every issue of Radio World all year long.

To become eligible to win, you need to complete these three easy steps:

- 1) Register online at our Web site www.rwonline.com
- 2) Click the Silver Sweepstakes icon on our homepage
- 3) Fill out the electronic entry form — that's it, you're done!

It's your chance to celebrate our Silver Anniversary with these fine Radio World supporters ...

Contest Rules: To enter the drawing, simply register online at www.rwonline.com/sweeps. 25 drawings will be held throughout the year. Contest ends December 19, 2001. One prize per winner. All contestants MUST reside in the United States and have a valid mailing address. Winners should receive prizes within 30 days of notification, however, actual delivery time may vary and is not guaranteed by IMAS Publishing. Federal, state and local tax laws may apply to prizes and are the sole responsibility of the winner.

ADVERTISEMENT

AM- FM Allocation & Design Processes Symposium

February 21-25, 2002
 San Antonio, Texas

The most comprehensive skill oriented educational event in the Broadcast Industry

Our symposium is designed to grow your current skill level 10-100 times.

www.RFTrainingCo.com
 Symposiums

If you have any further questions please feel free to call or email them to

Melissa Sirianni
 210-805-0257

Melissa@RFTrainingCo.com

Products & Services SHOWCASE

THE RAMSEY PX1 35W FM STEREO EXCITER/TRANSMITTER



- Frequency Agile - 87.5 to 108.0 MHz
- Digitally Synthesized PLL
- Temperature and VSWR Protected
- 120/240/12 VDC Power with Auto Battery Back-up

**ONLY
\$1795⁹⁵**

The PX1 was designed to fill the needs of the low power or community broadcaster. Set-up and use is fast and simple with just 5 buttons to access all parameters - power, frequency, modulation, and more. The 2-line vacuum fluorescent display gives you "at-a-glance" verification of all important functions. The micro-controller continuously monitors frequency, temperature, deviation, etc. and makes subtle adjustments on the fly like a "virtual" station engineer.

Two balanced inputs (XLR) are provided, as are inputs for SCA and RDS (BNC) RF Output connection is type "N", output power is adjustable from 1 to 35 Watts.

If you're setting up a new station, we also supply consoles, microphones, antennas, feedline, and more.

AVCOM-RAMSEY TECHNOLOGIES

793 Canning Parkway • Victor, NY 14564
Order Toll-Free: 800-446-2295

www.highpowerfm.com • sales@ramseyelectronics.com

REMEMBER THE *CORTANA*
FOLDED *UNIPOLE* ANTENNA?
WE STILL MAKE IT WITH THE
SAME HIGH QUALITY MATERIALS
AND WORKMANSHIP.
IT FEATURES...



- **BROAD BANDWIDTH** for better sound,
- **GROUNDING ANTENNA** for lightning & static electricity,
- **EUMINATES ISOCOUPPLERS** in VHF & UHF antenna lines,
- **BEST ANTENNA FOR DIRECTIONAL ARRAYS.**

ALSO

**DETUNING SYSTEMS FOR ANYTHING THAT DISTORTS YOUR
AM COVERAGE PATTERN: TOWERS, POWER LINES, TANKS
OR ANY METAL STRUCTURE.**

FOR INFORMATION CALL, FAX OR WRITE:

nott ltd.

4001 La Plata Hwy
Farmington, NM 87401

phone 505-327-5646 fax 505-325-1142

AM ANTENNA SYSTEMS

**Antenna Tuning Units
Transmitter Combiners
Folded Unipole Antennas
Diplexers, Triplexers
RF Components**

LBA antenna systems will improve your efficiency, performance and reliability. Our products are designed and built to international standards. Call LBA Technology for RF systems and excellent technical service.

800-522-4464 / 252-757-0279
Fax 252-752-9715

Email: lbatech@lbagroup.com
or Contact Our Representatives Worldwide



LBA Technology, Inc.

P.O. Box 8026, Greenville, NC 27835 USA
35 YEARS OF WORLDWIDE
ENGINEERING SERVICES

An LBA Group Company



www.lbagroup.com

© 1998

THE MOST COMPLETE FM TEST SET AVAILABLE AND IT'S A GREAT MOD MONITOR TOO!



- Complete proof of performance instrument
- Frequency agile
- Converts standard X-Y scope into a spectrum analyzer

The QEI Model 691 Modulation Monitor and Test Package is a high technology precision instrument that set a new standard for FM performance measurement tools. We also manufacture a very comprehensive FM transmitter Line. Contact QEI today and let us put our innovations to work for your station. Contact our sales department at 800-334-9154 (International 856-728-2020) or by e-mail at qeisales@qei-broadcast.com.

<http://www.qei-broadcast.com>

QEI CORPORATION

PO Box 805

Williamstown NJ 08094 USA

800-334-9154/856-728-2020

856-629-1751 Fax



Retrieve and Review EAS Logs...from your Office

Dawning's Secure Network Interface provides a simple and cost-effective method for any broadcast location to quickly and easily retrieve and transmit FCC Emergency Alert System test and activation logs, even those from your remote locations. Imagine having this information automatically delivered to you for regular review as required by the FCC!

Technical Specs:

- Dimensions: 5.6"W x 4.6"D x 1.5"H
- Serial Connection: RJ-45 8-pin Serial Port
- Ethernet Network Connection: RJ-45
- FTP or email data delivery options
- Programmable serial ports connections
- Definable IP address and network connection parameters
- List Price: \$595



www.dawning.com/?RW

1-800-332-0499

THE COST EFFECTIVE ALTERNATIVE TO MANUFACTURER SERVICE

**SERVICE, REPAIR &
CALIBRATION**

- STL's • RPU's • TSL's
- Exciters • Optimods
- AM/FM Monitors
- Remote Control Systems

**SPECIALIZING IN
EQUIPMENT BY**

- Belar • Marti
- Moseley
- McMartin
- TFT
- And others...

WE ALSO PROVIDE

Free, over-the-phone technical assistance
STL loaner/rentals
PCL 505 Certification



2198 Hubbard Lane, Grants Pass, OR 97527

(541) 471-2262

CUSTOM CABINETRY & PREWIRED SYSTEMS

BUILDING STUDIOS FOR OVER 34 YEARS



**WGN
CHICAGO**



RAM BROADCAST SYSTEMS, INC.

www.ramsyscom.com PHONE: 800-779-7575 FAX: 847-487-2440

TIPS AND TRICKS

Make the Most of a Small Space

Ty Ford

It has been a while since I was asked about maximizing studio spaces in radio stations. One of my previous ideas came about when station floor space started to get scarce. The idea was simple, a dubbing station set up near the traffic department to free the production studio for more pressing tasks.

The station consisted of a reel-to-reel machine, a monitor/router with speakers and a recording cart machine. Not everybody in the traffic department would feel comfortable dubbing spots to cart, but usually someone would. And even if the traffic department was not up to the task, anyone who was could achieve the same effect.

Not long after I had that idea, I saw a new single rack-space device on the market that fit the perfect description of my proposed dubbing station monitor/router. It was obvious that we had both had the same idea at the same time, or maybe they had read my article.

I have been asked to put another suggestion on the table. The original thought was to have me write an article about studio design. My response was, "With consolidations resulting in more and more station cohabitations, who has room?" A few more Diet Dr. Peppers later, the idea of a voiceover booth began to take shape.

Birth of the V/O booth

The V/O booth would not just be a room with headphones and a microphone hung in it. This would be a room in which airstaff could record voice tracks that would later be used by the production or creative directors in other pieces of work.

There are too many hardware/software solutions to mention. I don't really care which you use, as long as the job gets done. This article is about the booth; making it work within your facility is your job.

The booth would not have to be large, just enough for a single microphone, a preamp, headphone amp, some remote controls, effective lighting, copy stand, HVAC ducts and a standing voice talent.

It would have to be treated acoustically to absorb and diffuse sound properly within and to keep sounds out (and keep the occasional yelps and other creative outbursts from getting into other studios).

Small spaces have their own acoustic problems. If the acoustical energy exciting a space is great enough, some forms of resonance occur because the absorptive material simply can't deal with absorbing more than a certain amount of energy. When that happens, you can hear the smallness of the room.

Slapping up foam everywhere in a small room can result in a "sproingy" sound. Putting up too much absorptive material also causes the talent to scream to hear him or her self.

The answer is a balance of diffusive and absorptive surfaces and smaller windows. A window in the door, in lieu of an externally mounted "Recording" light, lets passerby know whether the booth is occupied. A window looking into an adjacent control room allows for eye contact. But the bigger the glass, the

more you'll hear it.

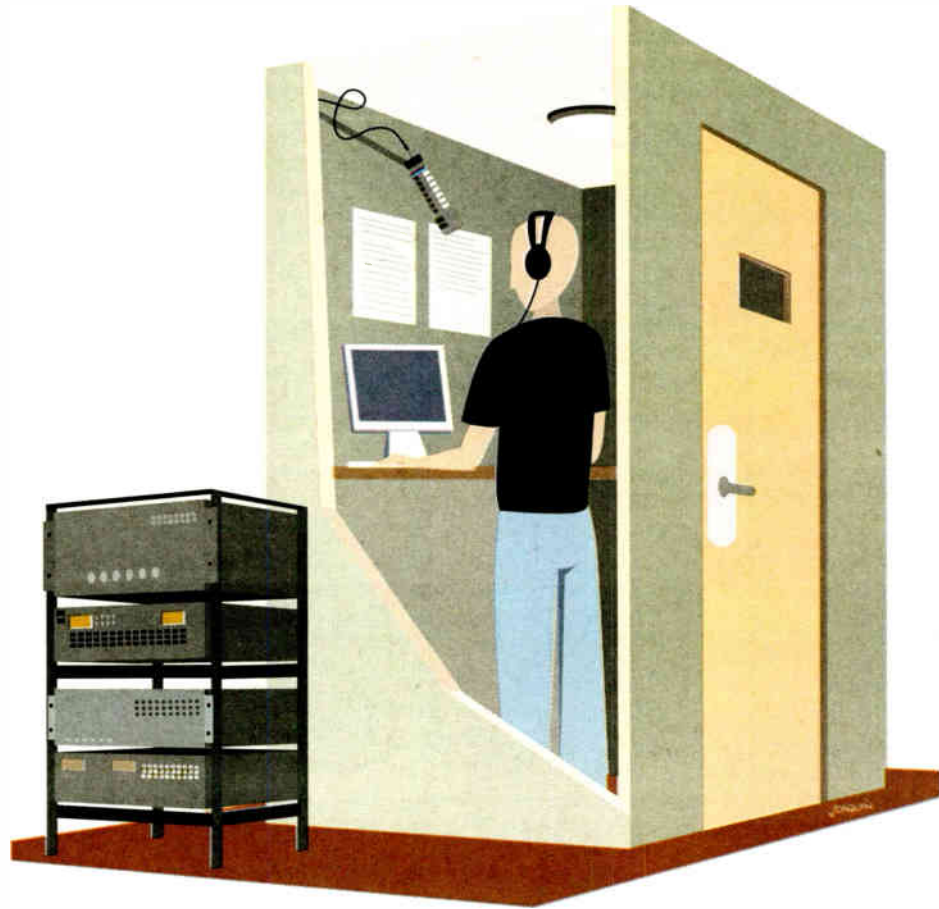
One should also think about the overhead. Dropped ceilings alone don't offer sufficient sound abatement. You need to isolate the V/O booth from surrounding spaces by capping the space with a dry-wall ceiling.

Take the walls up to the about eight or 10 feet. Normally I'd connect an HVAC

supply duct through the ceiling with the return at the bottom of the room.

I prefer no noisy equipment with hard drives and fans in the booth. All such gear would be remotely placed to preserve the quiet of the booth.

In 1990, when I installed my first DSE7000 (now Audicy) workstation, I put the computer in a closet in an adja-



An artistic rendering of a V/O booth. All noise-generating components are located outside, and a flat-screen monitor saves space and runs cool.

cent room and ran the cables to it through the wall. I recently did the same with my Pro Tools/Mac G4 rig.

The one exception I made was to leave a seldom-used external SCSI CD RW record/play drive in the space. I only power it up to burn copies.

You could put a small workstation in another space and run keyboard, mouse and monitor cables to the V/O booth. Spending a few extra bucks on a flat-panel monitor will keep the space cooler and less-crowded. Add a couple of small powered audio monitors and you could have a standup, full-tilt boogie operation, but I digress.

Gating the noise

It is arguable that with a good cardioid microphone, expander/gate and close miking technique, that background noise won't be a problem.

I'll nod and mention that at the big studios where major V/O work is done, the booth is quiet. Yes, you can get acceptable results with an expander or gate on the mic circuit. I just like voice tracks that have a background of quiet room instead of ambient-free expander deathstar. Also, the more powered gear you have in the booth, the more heat.

Assuming you will be recording into a digital system, the ability to send your files over a network to a folder for use later is desirable.

If networking is not possible, removable drives with no disk inserted do not make noise. You could install such a drive in the booth and dump your finished tracks to removable discs when you are finished recording and pass them to whoever needs them.

If you already have a news or sports booth that only gets used for part of the day, you may already be on your way to a limited V/O booth, provided the news or sports department is not also using it as office space.

There are many ways to skin the studio space cat. These are just ideas to get you started.

Ty Ford may be reached via e-mail to www.jagunet.com/~tford.

United States Postal Service
Statement of Ownership, Management, and Circulation

1. Publication Title: RADIO WORLD
2. Publication Number: 0 2 7 4 - 8 1 5 4
3. Filing Date: 12/5/01
4. Issue Frequency: BI-WEEKLY
5. Number of Issues Published Annually: 26
6. Annual Subscription Price: FREE
7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4): 5827 COLUMBIA PIKE FALLS CHURCH FAIRFAX COUNTY VA 22041
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer): 5827 COLUMBIA PIKE FALLS CHURCH VA 22041
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank):
Publisher (Name and complete mailing address): CARMEL KING 5827 COLUMBIA PIKE FALLS CHURCH VA 22041
Editor (Name and complete mailing address): PAUL MC LANE 5827 COLUMBIA PIKE FALLS CHURCH VA 22041
Managing Editor (Name and complete mailing address): SHARON RAE PETTIGREW 5827 COLUMBIA PIKE FALLS CHURCH VA 22041
10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.):
Full Name: STEVAN B DANA Complete Mailing Address: 5827 COLUMBIA PIKE FALLS CHURCH VA 22041
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box: None
Full Name: Complete Mailing Address:
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one):
 Has Not Changed During Preceding 12 Months
 Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)

13. Publication Title: RADIO WORLD
14. Issue Date for Circulation Data Below: SEPT. 1
15. Extent and Nature of Circulation
Average No. Copies Each Issue During Preceding 12 Months Actual No. Copies of Single Issue Published Nearest to Filing Date
4. Total Number of Copies (Net press run) 19,681 18,293
5. Paid and/or Requested Circulation (Sum of 5a, 5b, and 5c)
a. Paid (1) Paid/Requested Outside-County Mail Subscriptions (Sales on Form 3541) (Include advertiser's proof and exchange copies) 16,598 15,210
b. Paid and/or Requested Circulation (2) Paid In-County Subscriptions (Include advertiser's proof and exchange copies)
c. Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution
d. Other Classes Mailed Through the USPS
6. Total Paid and/or Requested Circulation (Sum of 5a, 5b, 5c, and 5d) 16,598 15,210
7. Free Distribution by Mail (Sum of 7a and 7b)
a. Outside-County as Stated on Form 3541 2,582 2,470
b. In-County as Stated on Form 3541
c. Other Classes Mailed Through the USPS
8. Free Distribution Outside the Mail (Carriers or other means) 350 428
9. Total Free Distribution (Sum of 7a, 7b, and 8) 2,932 2,898
10. Total Distribution (Sum of 6 and 9) 19,530 18,108
11. Copies not Distributed 151 185
12. Total (Sum of 10 and 11) 19,681 18,293
13. Percent Paid and/or Requested Circulation (15c divided by 12b times 100) 84.0
16. Publication of Statement of Ownership: Publication required. Will be printed in the next issue of the publication. Publication not required.
17. Signature and Title of Editor, Publisher, Business Manager, or Owner: *Stevan B Dana / Owner* Date: 26 Oct 2001
I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

Instructions to Publishers
1. Complete and file one copy of this form with your postmaster annually on or before October 1. Keep a copy of the completed form for your records.
2. In cases where the stockholder or security holder is a trustee, include in items 10 and 11 the name of the person or corporation for whom the trustee is acting. Also include the names and addresses of individuals who are stockholders who own or hold 1 percent or more of the total amount of bonds, mortgages, or other securities of the publishing corporation. In item 11, if none, check the box. Use blank sheets if more space is required.
3. Be sure to furnish all circulation information called for in item 15. Free circulation must be shown in items 15d, e, and f.
4. Item 15c, Copies not Distributed, must include (1) newspaper copies originally stated on Form 3541, and returned to the publisher, (2) estimated returns from news agents, and (3) copies for office use, leftovers, spoiled, and all other copies not distributed.
5. If the publication had Periodicals authorization as a general or requester publication, this Statement of Ownership, Management, and Circulation must be published; it must be printed in any issue in October or, if the publication is not published during October, the first issue printed after October.
6. In item 16, indicate the date of the issue in which this Statement of Ownership will be published.
7. Item 17 must be signed.
Failure to file or publish a statement of ownership may lead to suspension of Periodicals authorization.
PS Form 3526, September 1998 (Revised)

BROADCAST

Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

Want to Sell



Full product line for sound control & noise elimination.
www.acousticsfirst.com

Dielectric 3 bay FM antenna on 103.5. Cal Tharp, WASE, 519 North Miles St., Elizabethtown KY 42701. 270-766-1035 or email: ctharp@bigcat1055.com.

Shively 3 bay FM antenna on 105.5. Cal Tharp, WASE, 519 North Miles St., Elizabethtown KY 42701. 270-766-1035 or email: ctharp@bigcat1055.com.

AMPLIFIERS

Want to Buy

RCA, Altec tube amplifiers & mixers in any condition, working or not. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.



ANTENNAS/TOWERS/CABLES

Want to Sell

Dielectric 3-5/8" motorized four port coaxial switch. Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.

GUNION'S TOWER PAINTING
Get It Done Right!
320-764-2572

ERI G-5CPS-4 high power antenna. Four bay tuned to 98.5. Buyer pays all shipping costs, \$7000. Max Turner, Susquehanna Radio, 6810 Shadeland Ave, Indianapolis IN 46220. 317-558-7302.

Andrew 310' 1-5/8" foam coax, used but in good condition, on rolls with connectors, 2 available, \$1500 ea +shpg. Larry Schrecongast, WTYM, POB 1032, Indiana PA 15701. 724-543-1380.



ICE KRACKERS, INC.

Inexpensive permanent protection of guy wire anchor hardware from guy wire ice slides. Average cost \$400 for 400-foot tower. ICE KRACKERS sized by guy wire diameter. All sizes available. 273 Circle Drive, Springfield, IL 62703 (800) 747-8921 Ask for Jim Newbanks

ERA 3 bay 104.3 antenna with heat, \$900 +shpg. Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1033 ext 11.

Phelps Dodge 1 bay antenna on 103.3 with radomes, \$250 +shpg. Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1103 ext 11.

Rohn self supporting tower on ground, sections 16NH through 11N, 120', \$16,000. Larry Schrecongast, WTYM, POB 1032, Indiana PA 15701. 724-543-1380.

AM Ground Systems

Reliable, On-time Installation Quality Workmanship Ground System Evaluation and Repair

www.amgroundsystems.com
1-877-766-2999

Shively 6813 2 bay 103.3 antenna with radomes, \$500 +shpg. Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1103 ext 11.

LPFM ANTENNAS

\$95!

3db gain single bay
fmbroadcasters.com

AUDIO PRODUCTION

Want to Sell

Complete radio station for \$695! Just add mike & transmitter. Great for LP, college, web stations. Includes 5 channel BE mono console, (2) Russco StudioPro turntables with Pro Audio arms & Stanton cartridges, (2) Pioneer PMD502 6-pack CD changers, (1) Tapecaster 700P cart machine. Cash & carry! At this price I don't want to pack & ship. Bob Savage, WYSL, 5620 S. Lima Rd, Avon NY 14414. 716-346-3000.

Denon TU-680 AM stereo tuners. Cal Mandel, Brawley Broadcasting Co, 2756 W Canyon Ave, San Diego CA 91213. 858-279-8030.

AUDIO RESTORATION

We bake squeaky tapes, remove hiss, hum and background noise and remaster old airchecks, jingles or production onto CD. Visit www.kenr.com for a demo. Bring old tapes back to life!



CART MACHINES

Want to Sell

Audiocord DLPM single play cart player, \$450. Mark Larsen, KBQR, Box 20335, Piedmont CA 94620. 510-465-6035.

CD PLAYERS

Want to Sell

Audiometrics CD-10 professional CD players (2), one needs repairs, \$800. George Arroyo, WQNO, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800 ext 110.

COMPLETE FACILITIES

NEW OR USED COMPLETE PACKAGES
STUDIO/STL/TRANSMITTER/ANTENNA OR ANY COMBINATION OF ABOVE.
-LEASE OPTIONS-
-EMERGENCY RENTALS-
-REMOTE BROADCAST RENTALS-
SCMS, Inc. (800) 438-6040
"You Know We Know Radio"

CONSOLES

Want to Sell

Autogram IC-10, stereo, good condition, \$1000. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Electro-Voice EVT-5212 Tapco mixer, stereo 12 channel, like new, \$350 +shpg. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

Harris Medalist-8, removed from service 10/01. Power supply & manual. Will deliver within 150 miles, \$500/BO. Chuck Crouse, WLMJ, 27 Fraley St, Kane PA 16735-0868. 814-837-9711.

Shure M267, 4 channel mixer, \$325. Mark Larsen, KBQR, Box 20335, Piedmont CA 94620. 510-465-6035.

TOA RX-5-16, 16 channel stereo mixer, like new, \$375 +shpg. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

CCA The Ultimate Console, mono 10 pots with all the features, all solid state with plug in op amps, all works, in medium condition. Has 2 VU meters, one for audition & one for PGM, \$350 +UPS shpg. James Cunningham, KAZC, Rt 2 Box 113B, Stonewall OK 74871. 580-265-4496.

Want to Buy

Western Electric 25-B. Will pay \$7800 for this WE broadcast console in any condition. Also WE literature, tubes, manuals, radios, etc. Larry Drago, WELI, 495 Benham St, Hamden CT 06514. 203-248-8814.

Western Electric 25A. Paying up to \$7500 for this console & always buying WE mics, tubes, catalogs & turntables. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

LIMITERS/AUDIO PROCESSING

Want to Sell

Alesis MEQ-230, 30 band EQ, like new, \$175 +shpg. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

Alesis 3630 compressor-limiter, recording or broadcast, like new, \$125. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

Collins 26U-1 limiter for parts or just the meter. Tim Coffman, 858-571-5031.

UREI, Universal Audio, dbx, Collins, RCA, Gates. Tim Coffman, 858-571-5031.

MICROPHONES

Want to Sell

Audio Technica AT9400 uni/stereo condenser mic, \$175. Mark Larsen, KBQR, Box 20335, Piedmont CA 94620. 510-465-6035.

Sennheizer 441 in box with papers, \$300. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Shure headset mic condenser with case, cables, \$120. Mark Larsen, KBQR, Box 20335, Piedmont CA 94620. 510-465-6035.

Want to Buy

RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted, top dollar paid! 615-352-3456, FAX: 615-352-1922. E-mail: billbryantmgmt@yahoo.com.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

Neuman, RCA, Shure, AKG, Beyer, others 1950-1990. Tim Coffman, 858-571-5031.

RCA 77-44-74 etc, ribbon mics, on-air lights, console, manuals, tubes, etc. Highest prices paid. Larry Drago, WELI, 495 Benham St, Hamden CT 06514. 203-248-8814.

Buying entire collections! Call for best price. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

RCA 77DX/44BX. Will pay \$1000 for these mics. Call anytime. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

MISCELLANEOUS

Want to Sell

ROTRON BLOWERS AND PLATE BLOCKERS, new & rebuilt for Elcom, Harris, CCA, CSI, McMartin. Goodrich Ent. 11435 Manderson St, Omaha, NE 68164 402 493 1886 FAX 402 493 6821

SCA RADIOS for sale. Any Quantity. Call: 212-244-1140.

Comrex Hot Line, good condition and Comrex Hot Rack, like new, \$2600/both. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Comrex Nexus Units (2), scratched cases, perfect operation, \$1175 each. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

BAY COUNTRY BROADCAST EQUIPMENT

BUY - SELL - TRADE
Your #1 Source For
Quality Used Radio
Broadcast Equipment

View The Latest List On Line At
<http://www.baycountry.com> Or
Call And We Will Fax It To You.

7117 Oliva Rd., Baltimore MD 21220
Toll Free: 877-722-1031
FAX 786-513-0812
E-mail: info@baycountry.com
Member of BBB

Kohler 75 KW generator, 3 phase, 240/208 diesel, 358 hours, x-per switch, mufflers, good condition, \$7,500. Joe Schloss, KFCD, POB 260, Spencer IA 51301. 712-262-1240.

Prodelin C/KU band 3.4 meter Aziel truss mount satellite receive dish with KU band LNB, three available, unused, \$1200 ea +shpg. Larry Schrecongast, WTYM, POB 1032, Indiana PA 15701. 724-543-1380.

RF CONTACTORS MICA CAPACITORS

(IN CANADA ONLY)

USED AM XMTRS

FROM

GELECO

416-421-5631

FAX: 416-421-3880

Two boxes (19 total) or new motors. Oriental motor, Japan S-301 motors, 7.5W 115V 1500/1800 rpm, \$30/all. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Want to Buy

Old audio/Audio Engineering magazines prior to 1953. Mike Stosich, Esoteric Sound, 4813 Wallbank Ave, Downers Grove IL 60515. 630-960-9137.

Midwest Digital Services Inc. Professional Audio/Video Service

Authorized Service: Sony, Panasonic, Tascam
Repairs for Denon
Sales: Sony, Tascam, Nagra

Specialists in DAT, DTRS, CD, Betacam, DVcpro & Dvcam

12859 S. Harlem Ave., Palos Heights, IL 60463
800-809-3309; 708-448-7539; Fax 708-448-7678
midwestdigital@compuserve.com
midwestdigitalservices.com

RCA on-air lights in any condition, working or not, will pay best prices for them. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

MONITORS

Want to Sell

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

RECEIVERS/TRANSCIVERS

Want to Sell

Broadcast Tools DSC-20 channel changers for Starguide, never unwrapped, \$125 ea. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Broadcast Tools PSC/B to change DSC-20 for Starguide, never unwrapped, \$195 ea. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Broadcast Tools UI-4II adds logic or remote functions to equipment, never unwrapped, \$65 ea. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Broadcast Tools USC-16 universal satellite channel controller, never unwrapped, \$150. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Vertex FTH-7008 (4), 16 channel, 5 watt radio with IVC 29 charger, can program UHF, \$75 each. Peter Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Vertex VX-200, 6 channel UHF 450-470 chargers (2), 5 watt handheld, can program, \$75 each. Peter Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Bext STL receivers (2). Cale Tharp, WASE, 519 North Miles St, Elizabethtown KY 42701. 270-766-1035 or email: ctharp@bigcat1055.com.

Harris 8550 receiver with book, power supply & cards for 62 & 62.8 MHz, very good condition, \$150. James Cunningham, KAZC, Rt 1 Box 113B, Stonewall OK 74871. 580-265-4496.

RECORDERS

Want to Sell

Otari MX5050 BII, very good condition, \$850; MX5050 BII, good condition, \$650. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Tascam ATR60-2T, top of the line 2 track with center track time code, like new, only 200 hours use, \$1990. Jeff Ostler, TRAX/KTKK Radio, 2470 North Fairfield Rd, Layton UT 84041. 801-771-1820.

Tanberg 15-21 Series 15 reels (2), uses 7" reels, like new, but needs belt, \$50/both. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Teac X-2020M half track, 15 ips, 10" reels, low hours, 7 Ampex 706 pancakes included, \$700/BO. Ken Boone, Family Programs, POB 444, Paradise CA 95969. 530-877-7167.

Teac X-2020M half track, 15 ips, 10" reels, low hours, 7 Ampex 706 pancakes included, \$700/BO. Ken Boone, Family Programs, POB 444, Paradise CA 95969. 530-877-7167.

Teac X-2020M half track, 15 ips, 10" reels, low hours, 7 Ampex 706 pancakes included, \$700/BO. Ken Boone, Family Programs, POB 444, Paradise CA 95969. 530-877-7167.

Want to Buy

ITC 750. Need motor, part #SAT-6a two speed capstan motor. Tony Wortmann, WJAG, 309 Braasch Ave, Norfolk NE 68701. 402-371-0780.

REMOTE & MICROWAVE

Want to Sell

AIR STREAM TRAVEL TRAILER, 29 ft, custom built into radio promotional diner. Includes: generator, LP gas tanks, air mast, electrical distribution system and radio production area in rear. See website at: www.dispatchbroadcast.com/radiodiner. Cost: \$11,000.00, located in Columbus, Ohio. Tow vehicle available at additional cost. Contact: Marvin Born, 614-460-3914 or mborn@wbns.com.

Comrex LX-7 frequency extender/encoder, \$200. Mark Larsen, KBQR, Box 20335, Piedmont CA 94620. 510-465-6035.

REMOTE EQUIPMENT RENTAL

Silver Lake Audio
(516) 763-1776
silverlakeaudio.com

Symetrix TI-104 telephone interface, 4 lines, 2 consoles, \$500. George Arroyo, WQNO, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800 ext 110.

Melco Max24, operational phone PBX system. Accommodates 8 trunks & up to 24 extensions. Intercom, program on hold, paging. Uses standard touch-tone desk sets for extensions (not included). Power supply, CPU, documentation included. Perfect for smaller stations or associated businesses. Free to good home, no shipping, come and get it. Bob Savage, WYSL, 5620 S. Lima Rd, Avon NY 14414. 716-346-3000.

OFF THE AIR?
Emergency Back-up Rentals
FM Exciters - STL's -
FM Pwr Amps - Antennas -
Studio & Test Equipment
SCMS Inc (800) 438-6040
"You Know We Know Radio"

Musicam CDQ Prima 110 S/N 021310, BO +shpg; Musicam CDQ Prima 110 S/N 021309, BO +shpg. Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1103 ext 11.

MusicamVirteX StarGuide II, 2 decoders, S/N 005334, BO +shpg; MusicamVirteX StarGuide II, 1 decoder, 1 relay, S/N 005146, BO +shpg. Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1103 ext 11.

STATIONS

Want to Sell

DUE TO DEATH OF OUR FATHER, TWO GREAT RADIO STATIONS FOR SALE: North East California, great hunting and fishing, 5000 watt AM 570, Class C FM 100,000 watt, \$250,000 or Best Offer, highly motivated! Phone 530-233-3570.

START YOUR OWN RADIO STATION ANYWHERE IN THE U.S. FOR ONLY \$1500!

Buy an FCC Certified low power AM transmitter & cover up to a 4-mile radius. No FCC license required. Call (401) 322-1743 or online to: www.wbqj.org for more info.
DiPonti Communications
244 Post Rd, Westerly RI 02891
FCC ID: DFD624TA100
We now accept major credit cards



Broadcast Equipment Exchange

"BEE" in the habit of selling your used equipment here!

Call Simone for details at
(703) 998-7600, Ext. 154.

AM CP. Northern California coast. Fulltime. Joint venture. \$10,000 minimum. (478) 741-1710. wrecktech@yahoo.com.

SELLING OR BUYING....visit: www.broadcaststations4sale.com. We are now accepting new listings. We make it easy to sell your radio station.

STEREO GENERATORS

Want to Sell

Panasonic VP-8254P AM C-quam stereo generator, \$75. Mike Stosich, Esoteric Sound, 4813 Wallbank Ave, Downers Grove IL 60515. 630-960-9137.

TAPES/CARTS/ REELS/CD's

Want to Buy

Drake Chenault 10.5" music reels, contempo 300, lrary reels, 1979-1990, also seasonal reels & cue sheets. Chuck Raub, 570-434-2782.

TEST EQUIPMENT

Want to Sell

Amplex 300E vacuum tube voltmeter, \$30; Beta Scope non destructive thickness gauge, \$30; (4) HP 400D vacuum tube voltmeters, \$40/all; 12 vacuum tube voltmeter, \$25; HP 400L vacuum tube voltmeter, \$20; Sierra Electronics scope in metal box, \$20; Standard electrical products Type LR-5 Adjust-A-Volt variable transformer, cable cut, \$20; Supreme 574 electronic set tester in case w/manual, \$40; Motorola TA-42 input & output terminals, T&R 2-25 amp fuses, 1-15 amp fuse, \$30. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

General Radio 650A audio frequency impedance bridge in very good condition with big beautiful vernier knobs, null meter & 1 kH oscillator. Will work with external oscillator, very accurate, reads cap. inductance & res, \$50. James Cunningham, KAZC, Rt 1 Box 113B, Stonewall OK 74871. 580-265-4496.

TRANSMITTERS

Want to Sell

BE FM-30, 30KW FM. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

Harris-Gates BC-10H 10KW AM transmitter. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

RCA BTF-20-E1. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

RCA BTF-5-E1 5KW FM transmitter, single phase. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

Continental 314R-1 AM xmt, 1 kilowatt, tuned to 1600 kHz, located in Chicago IL, \$5000. George Arroyo, WQNO, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800 ext 110.

Cunningham CM 30-50 rack mount presunrise transmitter. Adjusts 0-50 watts, measures 19" wide x 12" deep x 8.75" high. 15 lbs, FCC approved, 3 tubes, 1 transistor, new/complete with instruction book, \$750. James Cunningham, KTGS, RT 2 Box 113B, Stonewall OK 74871. 580-285-4496.

Harris MW-5 AM 5 kilowatts xmt tuned to 1140 kHz, presently on the air in Orlando FL, \$10,000. George Arroyo, WQNO, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800 ext 110.

Harris MW-5A, missing plate transformer, good for parts, tuned to 1290 kHz, located in West Palm Beach FL, \$1000. George Arroyo, WQNO, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800 ext 110.

WE RENT FOR LESS

Hotlines	FM Exciters
Zephyrs	STL's
Nexus	FM Pwr Amps
Audio	Test Equipment

If we don't have it, we will get it!
SCMS, INC. (800) 438-6040
"You Know We Know Radio"

Harris SX-1 AM xmt, 1 kilowatt, solid state, tuned to 1190 kHz, located in West Palm Beach FL, \$6000. George Arroyo, WQNO, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800 ext 110.

Bext STL transmitters (2). Cale Tharp, WASE, 519 North Miles St, Elizabethtown KY 42701. 270-766-1035 or email: ctharp@bigcat1055.com.

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

CORNELL-DUBILIER MICA CAPACITORS

FROM STOCK

JENNINGS VACUUM CAPACITORS

FROM STOCK

JENNINGS VACUUM RELAYS

SURCOM ASSOCIATES

2215 Faraday Ave., Suite A
Carlsbad, California 92008
(760) 438-4420 Fax: (760) 438-4759
e-mail: link@surcom.com web: www.surcom.com

hang tough----stay healthy
----above all----tell it
like it is----

RADIO! The beat goes on!

CROUSE-KIMZEY OF ANNAPOLIS
tops in broadcast equipment
1-800-955-6800
ask for Kathleen
kkannapolis@worldnet.att.net

STUDIO FURNITURE?
STURDY CUSTOMIZED SYSTEMS FOR EVERY NEED AND BUDGET!
WHY PAY ANY MORE?
SPACEWISE
800-775-3660
info@spacewise.com

CONSULTANTS



EVANS ASSOCIATES Consulting Communications Engineers

FCC Applications • Design • Field Engineering • Tower Detuning Upgrade & Relocation Studies • AM Directional Array Tuning & Proof

EXPERTS IN:
TV • DTV Transition • FM • Directional Antennas • RF Exposure

210 S. Main St., Thiensville, WI 53092, (262) 242-6000, FAX (262) 242-6045
<http://www.evansassoc.com> Member AFCC

Consulting Communications Engineers EMC Test Lab

- FCC Applications and Field Engineering
- Frequency Searches and Coordination
- AM-FM-CATV-ITFS-LPTV
- EMC Test Lab-FCC and European (IEC)

OWL ENGINEERING, INC.

E-mail: info@owleng.com 1-800-797-1338 Fax (763) 785-4631
8899 Hastings St NE, Minneapolis, MN 55449 (763) 785-4115 *Member AFCC*

T. Z. Sawyer Technical Consultants
www.sawyer.com

AM-FM-TV-LPTV

- FCC Applications & Exhibits
- Experimental Authorizations
- AM Directional Antennas
- High Power Antenna Arrays
- Frequency Studies
- Class Upgrades
- STL Applications
- Station Inspections

1-301-913-9287
FAX: (301) 913-5799
5272 River Rd, #460, Bethesda, MD 20816

GRAHAM BROCK, INC.

BROADCAST TECHNICAL CONSULTANTS

Full Service From Allocation to Operation AM/FM/TV/AUX Services; Field Work; Antenna and Facilities Design

Over 35 years engineering and consulting experience

912-638-8028
202-393-5133
www.grahambrock.com

Doug Vernier Telecommunication Consultants

Broadcast Engineering Consulting AM/FM/TV/LPTV/DTV

Custom mapping service
Frequency searches
Propagation prediction
FCC application preparation

V-Soft Software for your PC
(800) 743-3684
www.v-soft.com

System One Communications
Broadcast Constructors & Consultants
Houston, Texas
888-625-5649

- AM-FM Site Construction Specialists
- Complete Tower Service
- Antenna & Transmission Line Diagnostics
- Custom Studio Designs & Furniture

R. MORGAN BURROW, P.E. & ASSOCIATES, P.C.

ALLOCATION STUDIES (AM, FM, TV, LPTV) New facilities, site relocation, FM upgrade, duplex

FIELD WORK A SPECIALTY

- AM Directional antenna adjustment, measurement & proof
- RADHAZ measurements - RADiation HAZard evaluation
- FM & TV field intensity & other measurements
- Facility inspections for purchase/insurance purposes
- CATV Leakage Testing

ELECTROACOUSTICS OSHA measurements
304-258-7921 Fax 304-258-7927

M Celenza Communications Consultants

TV-\$550; LPTV-\$550; FM-\$250;
AM Freq Searches-Call for quote

Applications, Amendments & Upgrades
Antenna Structure Registration,
Field Work Avail
631-928-0077
Fax: 631-928-1905

MULLANEY ENGINEERING, INC. Consulting Engineers

- Design & Optimization of AM Directional Arrays
- Analysis for New Allocation, Site Relocation, And Upgrades
- AM-FM TV LPTV Wireless Cable (MDS/MMDS/ITFS/OFS)
- Environmental Radiation Analysis
- Field Work
- Expert Testimony

9049 Shady Grove Court
Gaitersburg, MD 20877
Phone: (301) 921-0115
Fax: (301) 590-9757
email: mullengr@aol.com

FASTER... MORE ACCURATE RADIO COVERAGE

- Real Time 3-D Displays
- Interference calculations
- Cost effective mapping
- Fully integrated databases
- Used by the FCC
- Latest standards built-in

RADIO SOFT

Visit us on the web at www.radiosoft.com
109 West Knapp Ave. • Edgewater • FL • (385) 426-2521



Market Analysis Engineering Software Ethnic/Demographic Data Custom Full-color Mapping Sales Marketing Packages

www.dataworld.com 800-368-5754
info@dataworld.com fax: 301-656-5341

Communications Technologies, Inc.

Broadcast Engineering Consultants
AM FM TV LPTV
Cellular/PCS Site Analysis

P.O. Box 1130, Marlton, NJ 08053
Phone: (856) 985-0077
Fax: (856) 985-8124
Internet: commtechrf.com

Clarence M. Beverage
Laura M. Mizrahi

Paradigm Associates, Inc
John Furr, President

Free Site Screenings for Coordination and Protection of AM Radio Stations.

FCC Applications-Field work
Tower Detuning
Upgrades & Relocations
TV>LPTV>AM>FM
210-828-4555
Mention ad
www.Pdigm-inc.com

TRANSMITTERS WTS (cont.)



**POWER TUBES
REBUILT

1/2 THE COST
OF NEW!**

ECONCO

TEL: 800-532-6626
INTL: +1-530-662-7553
FAX: +1-530-666-7760
www.econco.com
SE HABLA ESPAÑOL



TRANSCOM CORP.

Serving the Broadcast Industry Since 1978

Fine Used AM & FM Transmitters and Also New Equipment

<p>300W FM 1988 Harris FM 300K Solid State Single Phase</p> <p>1 KW FM 1981 Harris FM 1K Single Phase</p> <p>1 KW FM 1968 Harris FM 1H</p> <p>2.4KW FM 1995 QEI Quantum Solid State upgradeable to 6 KW</p> <p>2.5KW FM 1984 Harris FM 2.5K Single Phase</p> <p>2.5KW FM 1980 Harris FM 2.5K Single Phase</p> <p>2.5KW FM 1979 Harris FM 2.5K</p> <p>2.5KW FM 1976 Collins 831D Single Phase</p> <p>5 KW FM 1985 BE FM 5A</p> <p>6 KW FM 1994 Henry 6000D Single Phase</p> <p>10KW FM 1974 Harris FM10H/K</p> <p>15KW FM 1980 McMartin BF15.000</p> <p>25KW FM 1978 Collins 831E2C</p> <p>25KW FM 1980 CSI T-25-F</p> <p>30KW FM 1983 BE FM 30</p> <p>30KW FM 1988 BE FM 30A</p> <p>50KW FM 1982 Harris Combiner w/auto exciter-transmitter switcher</p>	<p>1KW AM 1981 Harris MW1A</p> <p>1KW AM 1982 Harris MW1A</p> <p>5KW AM 1996/8 Harris "Gates" 5 Solid State</p> <p>5KW AM 1980 Harris MW5A</p> <p>10KW AM 1986 Harris MW10B</p> <p>50KW AM 1978 Continental 317C-1</p> <p style="text-align: center;">EXCITERS</p> <p>Continental 802B Harris MX-15 BE FX 50 + FX 30</p> <p style="text-align: center;">Miscellaneous Equipment:</p> <p>Potomac Ins. AA51 Audio Anyl. (new)</p> <p>Belar SCM-1, SCA Monitor</p> <p>Moseley TRC-15 Remote w/ Hallikainen</p> <p>Moseley TRC-15-A Remote Control System</p> <p>Delta 4 Port SW 1 5/8 mot. #6730E</p> <p>SCA Generator (Max-15 Module)</p> <p>ATI Line Amplifier</p> <p>Optimod 8100A (cards 3 thru 9)</p> <p>Dummy Load, 5 KW water cooled</p> <p>Dummy Load 2.5 KW air cooled</p>
--	--

2655 Philmont Ave #200, Huntingdon Valley, PA 19006
800-441-8454 • 215-938-7304 • FAX No. 215-938-7361
VISIT OUR NEW INTERNET SITE: www.fmamtv.com
SEND YOUR E-MAIL REQUESTS TO: transcom@fmamtv.com

Collins 830D FM 1KW transmitter, \$1000 +shpg. Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1033 ext 11.

Moseley STL transmitter. Cale Tharp, WASE, 519 North Miles St, Elizabethtown KY 42701. 270-766-1035 or email: ctharp@bigcat1055.com.

FOR THE BEST PRICE & 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at 402-493-1886 day or night, FAX 402-493-6821.

Want to Buy

Western Electric, loose, boxed, or dirty radio and audio tubes needed. Paying top prices. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

TUBES

Want to Sell

EIMAC, AMPEREX, ED-COM, 3CX2500F3, 3CX3000A7, 4CX250B, 4CX300A, 4CX1000A, 4CX1500B, 4CX5000A, 4-400C, 811, 833C, ETC. WESTGATE 800-213-4563.

D And C Electronics Co.

NEW TUBES

We have the alternatives for all your needs, at the lowest prices, direct from OUR STOCK!!!
EIMAC, SVETLANA, PRO-TEK®, EEV and many others.
(352) 688-2374
PH: (800) 881-2374
FAX: (352) 683-9595

SE HABLA ESPAÑOL
WE EXPORT
VISA/MASTERCARD ACCEPTED

TUBES, Eimac, Svetlana
Phone: 905-844-5772
Fax: 905-844-6263
ams@hard-to-find.net
www.hard-to-find.net

Check out our web site!



TURNTABLES

Want to Sell

Technics SP-15 studio grade turntable, good condition, \$275. Andrew, KRKO, 425-304-1381 ext 102 or Andrew.skotdal@krko.com.

Gates 12" TT (4), with good motors but no tone arms. All run but need some attention, \$30 ea +shpg. James Cunningham, KAZC, Rt 1 Box 113B, Stonewall OK 74871. 580-265-4496.

CSI-T-25-A1 25KW early 1980's model. Good condition, 1140 kHz, make offer. Angie Sugalski, WCN, POB 444, Spartanburg SC 29304. 888-989-2299.

McPherson Radio Corporation

Specializing in pre-owned QEI FM transmitter products. All tuned and tested on your frequency, 6 month warranty included!

NRC has a facility to meet your broadcast needs for repair and complete overhaul of QEI exciters and low power transmitters. Other broadcast manufacturer products are also welcome.

Bob Brown
Voice/Fax: 856-232-1625
Email: rjbeme@aol.com.

Cunningham CM 30-50 rack mount pre-sunrise transmitter, adjusts 0-50W, measures 19" wide by 12" deep by 8.75" high. Weighs 15lbs. FCC approved, 3 tubes, 1 transistor, new/complete with instruction book, \$750. James Cunningham, KAZC, Rt 1 Box 113B, Stonewall OK 74871. 580-265-4496.

Harris 3.5 kW FM transmitter with BE exciter. Cale Tharp, WASE, 519 North Miles St, Elizabethtown KY 42701. 270-766-1035 or email: ctharp@bigcat1055.com.

Buying Or Selling Used Equipment?

You're in the right place!

Radio World

Broadcast Equipment Exchange

EMPLOYMENT

HELP WANTED

**National Public Radio
System Technical Center Technician, Satellite Operations**

Operates the System Technical Center Transmission & Traffic facilities; provides oversight & control over satellite carriers on PRSS satellite space; operates NPR's transportable uplink & other remote transmission equipment, as assigned & handles urgent scheduling & operations requirements. Works rotating shifts throughout the broadcast day & week - 24 hours a day, 365 days a year. Two years of college or equivalent experience required. Two years broadcast engineering experience; familiarity with the operations of computer terminals & standard audio testing practices, operations, & procedures; experience using a digital audio network; & ability to work rotating shifts required. Knowledge of automated audio switching systems & RF transmission systems; and/or public radio experience preferred. #RW1183

NPR produces & distributes award-winning news & cultural programming via public radio stations nationwide & the internet. We offer a business casual environment & excellent benefits, including three weeks of annual leave. For more information about this position & requirements, identifying position by number and title to: NPR, Human Resources Department, 635 Massachusetts Ave NW, Washington DC 20001-3753. Fax 202-513-3047, email: employment@npr.org. EOE

ADVERTISE YOUR EMPLOYMENT AD ON OUR WEB SITE FOR ONLY \$2 PER WORD!

ADS GET POSTED THE NEXT BUSINESS DAY AND WILL RUN FOR A FULL TWO WEEKS!

COMBINE THIS WITH AN AD IN OUR RADIO WORLD NEWSPAPER EMPLOYMENT SECTION AND REALLY COVER THE BROADCAST INDUSTRY AND THEN SOME!

www.RWOnline.com

Call Simone Fewell for all the details of

703-998-7600
Ext. 154

between 9-3 EST

POSITIONS WANTED

Jason M. here! Rookie radio disc jockey trained & ready to rock. On-air, production, copywriting. Oklahoma area. Jason, 405-703-0150.

Radio graduate ready for all opportunities. Over 9 years mobile DJ experience. Willing to relocate. Matt, 918-439-4202.

Talented freshman seeking starting position with winning organization in producing, promotions, sales, or on-air. Paul, 405-737-4478 or johnnievegas@aol.com.

Serious, funny, smart, dumb, cool & a geek. Specializing in copy writing. Interested in production, sports, interviews & on-air. Willing to travel, Lequane, 405-773-9747 or 405-706-8306.

Ready to prove myself as an entry-level announcer. Skilled in areas of newscasting, production, promotions, and on-air. Contact Scott at 405-720-7420 or scooterdj400@home.com.

Trained, creative, dependable, articulate, open-minded, kind, entertaining person with a willingness to learn & travel in the broadcast industry. Steadfast in action! Jaesen 405-292-6299 or rxon@msn.com.

Denise the "Hillbilly Headbanger" fresh out of school and ready to work as on-air jock or newscaster! Willing to relocate, so call 405-275-9069 or email: djdsweet@aol.com.

Deep, smooth & compelling. Freud? Or this excited rookie announcer? Call to find out. Will relocate. Jesse 405-390-3630 or longhair@aol.com.

Will travel! Trained & ready. Harad-working DJ will be an asset to your company as an announcer or production talent. Rachel 405-733-2557 or prinrchl@aol.com.

I'm Kelly and a recent broadcasting school grad and I'm ready to work. On-air, operations or sales. 918-832-1789.

Friendly, industrious, FCC commercial, 1st Class w/radar/amateur-extra radio licensed, CE, asst CE, seeking FT, PT, contract work, AM/FM, cable, TV, within 75 mile radius of metro NYC area. 718-969-5224 or write: Mitchell Rakoff, 81-12 Roosevelt Ave #702, Jackson Heights NY 11372-6746 or email: mitchellrakoff@yahoo.com.

Interested in On-Air, news and/or production positions. Excellent newswriting & production skills. Will relocate. Sheri, 405-602-0112 (B/U and UC preferred).

Radio World

Space is available!

To advertise, call 703-998-7600, Ext. 154.

Radio World

5827 Columbia Pike, 1st Floor • Falls Church, VA 22041
PHONE: 703-998-7600 • FAX: 703-671-7409

Classified Advertising Rates Effective January 1, 2001

	1x	6x	13x	26x
1-9 col inch (per inch)	\$95	90	85	80
10-19 col inch (per inch)	\$80	70	60	50
Distributor Directory	\$120	115	110	105
Professional Card	\$90	85	80	75
Station/Studio Services	\$175	150	125	100
Classified Line Ad	\$2/word			
Blind Box Ad	\$15 additional			

Call Simone Fewell, Ext. 154, Classified Ad Manager, to reserve space in the next issue.

Use your credit card to pay, we now accept VISA, MASTERCARD and American Express.

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:
 Are you currently a subscriber to Radio World?
 Yes No
 Signature _____ Date _____

Contact Name _____
 Title _____
 Company/Station _____
 Address _____
 City/State _____
 Zip Code _____
 Telephone _____

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

WTS WTB Category: _____
 Make: _____ Model: _____
 Brief Description: _____
 Price: _____

WTS WTB Category: _____
 Make: _____ Model: _____
 Brief Description: _____
 Price: _____

*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.
Broadcast Equipment Exchange
 PO BOX 1214, Falls Church, VA 22041 • Tel: 703-998-7600 • Fax: 703-998-2966

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEBSITE URL
23	360 Systems	www.360systems.com
40	AEQ	www.aeqbroadcast.com
31	Aphex Systems	www.aphex.com
38	Aphex Systems	www.aphex.com
30	Armstrong Transmitters	www.armstrongtx.com
44	ATI	www.atiguys.com
56	Audioarts/Wheatstone	www.wheatstone.com
44	Audion Labs	www.voxpro.net
55	Auditronics/Wheatstone	www.auditronics.com
46	Autogram Corporation	www.autogramcorp.com
48	Avcom-Ramsey Technologies	www.highpowerfm.com
30	BALSYS	www.balsys.com
45	Belar	www.belar.com
33	Bradley Broadcast	www.bradleybroadcast.com
35	Broadcast Richardson	www.broadcast-richardson.com
17	Broadcast Software Int'l (BSI)	www.bsiusa.com
46	Broadcast Tools	www.broadcasttools.com
28, 29	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
44	Circuit Werkes	www.circuitwerkes.com
6	Comrex	www.comrex.com
7	Comrex	www.comrex.com
44	Cortana	cortana@cyberport.com
48	Dawning	www.dawning.com
42	Econco	www.econco.com
46	Electronic Research Inc.	www.eriinc.com
27	ESE	www.eseweb.com
8	Fostex Corporation	www.fostex.com
44	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com
30	Grace Broadcast Sales	www.gracebroadcast.com
1	Harris	www.harris.com
18	Harris	www.harris.com
44	Henry Engineering	www.henryeng.com
15	Honeywell	www.oblighting.com
10	Inovonics	www.inovon.com
48	J Squared Technical Service	jsquared@cdsnet.net
12	Kintronic Labs	www.kintronic.com
21	Klotz Digital AG	www.klotzdigital.com
48	LBA Technology	www.lbagroup.com
43	Lynx Studio Technology	www.lynxstudio.com
36	Mager Systems	www.magersystems.com
25	MediaTouch	www.imediatouch.com
37	Moseley Associates	www.moseleysb.com
48	Nott Ltd.	www.nottltd.com
9	Omnia, a Telos Company	www.omniaaudio.com
48	QEI	www.qei-broadcast.com
19	Radio Design Labs (RDL)	www.rdl.net
5	Radio Systems	www.radiosystems.com
11	Radio Systems	www.radiosystems.com
48	RAM Broadcast Systems, Inc.	www.ramsys.com
47	RF Training Company	www.rftrainingco.com
3	S.C.M.S.	www.scmsinc.com
46	Silicon Valley Power	www.svpa.com
24	Sine Systems	www.sinesystems.com
39	Syntrillium Software	www.syntrillium.com
13	Telos Systems	www.telos-systems.com
41	Telos Systems	www.zephyr.com
2	Wheatstone	www.wheatstone.com
14	Wheatstone	www.wheatstone.com
46	Woodline Furniture	www.woodlinefurniture.com

Radio World
 THE NEWSPAPER FOR RADIO MANAGERS & ENGINEERS



Radio World celebrates 25 Years by giving you \$25.00 off the regular subscription price. Take advantage of this Silver Anniversary offer and enjoy the newspaper for Radio Managers & Engineers at this lowest rate ever.

Don't miss our Silver Sweepstakes in which 25 lucky winners will win valuable prizes! Look for contest details in this issue.

Special Introductory Rates • For New Subscribers Only

1 Year for \$34.00 (usually \$59.00) N95
 2 Years for \$59.00 3 Years for \$85.00
Payment Options: Check or money order payable to IMAS Publishing
 Visa M/C Am Ex

Card # _____ Exp _____
 Signature _____ Date _____
 Please Print:
 Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 E-Mail _____
 Phone () _____ Fax () _____

Your subscription begins upon receipt of payment. IMAS Publishing appears on all financial transactions.

READER'S FORUM

Armstrong's Alpine tower

I was fascinated with Frank Beacham's story of the Alpine Tower (Oct. 24, "Radio Legacy Saves N.Y. TV").

I had seen the PBS show some years ago, passed the tower frequently with a sense of reverence and was there helping WNET get up and running. The irony of Sarnoff's network turning to Armstrong's tower also struck me early on.

While I'm not familiar with the details, there may be a second irony. Among my collection of old radios and books is the 1944 Radio Annual.

Boomers and oldies

Interesting GM Journal article ("Boomers Still Drive Oldies Format") in your Sept. 12 issue. The 55+ demo has a passion for oldies music and a loyalty to stations and personalities that play it. We also have lower expenses and exploding disposable income. Adults 50+ spend more time online than 18-to-24-year-olds.

As a percentage of the population, we will increase 10 percent over the next 20 years, not erode as Mr. Rosin suggests.

We're still working, staying healthier much longer, and lots of us are enjoying

Advertisement for General Electric FM-Television-AM. Features a woman's face and text: "Perfect copies of her voice... over an FM wireless network".

The attached two-page ad (above) is on the inside front cover. Apparently GE did have an FM relay network in operation, with Alpine (then WFMN) the second station.

I don't know if this was based on Armstrong's work, but from your article, the concept was one feared by Sarnoff. Now, of course, GE owns NBC.

Leo Rosenberg, President, Direct Broadcast Services Inc., Valley Cottage, N.Y.

Write to Us: RADIO WORLD READER'S FORUM, P.O. Box 1214, Falls Church, VA 22041, radioworld@imaspub.com

(and buying for) grandchildren. What radio station would not like to have those demos and psychographics?

Dennis Winslow of KLDE hit it on the head when he said, "it's a matter of educating the advertisers." Problem is, most time buyers are not 50+ and don't listen to oldies stations or hang out with our audience. To paraphrase: "Out of Ear, Out of Buy."

A reading of Interep's Spring 2001 Research "55-plus Consumers — Ready for Prime Time" might change their minds about oldies stations.

Boomers are still booming, baby! Bob VanDerheyden, Group Program Director, deWit Media Group, Honesdale, Penn.

Broadcasters and EAS

The events of Sept. 11 and the lack of EAS activation only serve to prove what I have said all along: broadcasters do not need a government-mandated black box in order

Nip Closing Confusion

"The Mother Ship has landed," a voice whispers into the phone. "Code Red," says another. "Jack Frost," murmurs the next. No, it's not a scene from "The X-Files." It's the annual school-closing code-word confusion countdown. While hearing a big-shot school district superintendent say "The Mother Ship has landed" at 4 in the morning (then looping it and playing it back for the overnight guy) has its own merits, school closing code words may soon be a thing of the past.

SCHOOL CLOSINGS ALPHABETICAL BY COUNTY. Includes lists for INGHAM, LESLIE, MASON, MICHIGAN, and JONIA counties with handwritten notes and checkmarks.

For instance, as reported last issue, Vermont engineer Dennis Snyder helped implement a program to simplify closing procedures in New England. In an effort to streamline the process for broadcasters and school administrators, Snyder, a longtime school board member and Vermont Association of Broadcasters board member, suggested to the VAB that the association provide the means to list school advisories on the Internet.

The VAB was to purchase and maintain the server. The school administrator would only have to make one 4 a.m. phone call to a toll-free number.

Snyder and his crew set up the server, database, software systems and T-1 line. Each school administrator was assigned a touch-tone passcode for the school and district to access the password-protected school-closings page. A voice-prompt was set up to lead the caller to a menu of school status reports.

Snyder reports the successful completion of three years with the Internet system for school closings, with an expanded list that also includes private schools, New Hampshire and New York schools and large daycare centers.

We applaud this idea and encourage its implementation in other school districts. Morning drive is busy enough; add weather and school advisories to the mix and something is sure to slip through the cracks. Just take a look at this real-world example, shown in the illustration.

For more information on the system, contact Snyder at (802) 658-1230 or via e-mail to DSnyder@hallradioVT.com.

"Oh I forgot to tell you," the unidentified voice on the newsroom answering machine says. "Buses on paved roads only."

— RW

to serve the public.

When a situation arises, such as what occurred on Sept. 11, broadcasters around the country immediately went into emergency mode, dumping regular programming and commercials, to devote round-the-clock coverage to the emergency. And we'll do it again the next time there's an emergency, whether it be a hurricane, tornado, train derailment or, God forbid,

another terrorist attack.

The money we all spent on EAS equipment could have been better spent on generators, backup STLs or other items that would go a long way in our continuing ability to serve the public during an emergency.

Larry Fuss, President, Delta Radio, Inc., Cleveland, Miss.

Table with 3 columns: Name, Extension, Title. Includes Editorial Staff and Editorial Contributors.

Radio World Vol. 25, No. 25 December 5, 2001. Includes contact information and advertising sales representatives list.

Table with 2 columns: Name, Title. Includes Administration & Production staff.

W.C. Alexander, Bruce Bartlett, Frank Beacham, John Bisset, Read Burgan, Naina N. Chernoff, Harry Cole, Troy Conner, Vince Dittingo, Mark Durenberger, Ty Ford, Scott Fybush, Harold Hallikainen, Paul Kaminski, Peter King, Mel Lambert, Mark Lapidus, Carl Lindemann, Ted Nahil, Tom Osenkowsky, Ken R., Rich Rarey, Bruce Rogow, Randy Stine, Steve Sullivan, Travis the V/O Guy, Barry Umansky, Tom Vernon.

NEXT ISSUE OF RADIO WORLD DECEMBER 19, 2001. For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

Radio World (ISSN: 0274-8541) is published bi-weekly by IMAS Publishing (USA), Inc. P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Joanne Munroe, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966. Copyright 2001 by IMAS Publishing (USA), Inc. All rights reserved.

AUDITRONICS SERIES 2600

IT'S NEW — IT'S A BARGAIN — AND IT'S MODULAR, giving you any combination of mic, line or accessory modules. It's also INSTALLER FRIENDLY, with a hinged meterbridge that opens wide for direct access to connectors, trimmers and logic switches. Onboard cue and headphone amps keep you in budget. BEST OF ALL, you can have this **AUDITRONICS** tough-as-steel quality for **\$3995!**



- FULLY modular
- All electronic switching
- Separate mic & line inputs
- Eight or twelve input channels
- Two stereo Program busses
- Two Mono/Mix-minus busses
- Full-featured monitoring
- Twin VU meter pairs (PGM & switched)
- Opto-isolated control logic
- Built-in cue and headphone amps

AUDITRONICS

tel 252-638-7000/fax 252-635-4857/sales@auditronics.com

www.auditronics.com

copyright © 2001 by
Wheatstone Corporation

AUDIOARTS DIGITAL D-70



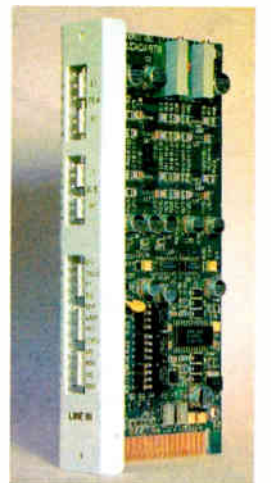
The D-70 digital console from AUDIOARTS not only utilizes the latest in digital technology and chip sets, it can be ordered with a serial interface that lets it integrate with most popular automation systems and station routers; it even has WHEATSTONE's exclusive VDIP™ software system.

Plug-in modules let you have any combination of mic, analog or digital line inputs, and the 4 stereo buses give you plenty of flexibility (each has both digital and analog outputs). With sample rate conversion on all digital inputs plus selectable console clock rates of 32, 44.1 or 48KHz (and an optional external house sync) the D-70 can fit right in with all your facility's present equipment.



WHEATSTONE'S VDIP™ Virtual Dipswitch Software lets you configure D-70 input channels with a laptop computer. Once configured console runs stand-alone.

With a compact, tabletop-mount footprint and a modular rear connector system that utilizes plug-in submodules for easy analog-to-digital field switches, the D-70 can be configured onsite quickly and easily. On the functional side, fullscale digital peak plus simultaneous VU metering, LED illumination everywhere, built-in machine interface, automatic timer and clock (stand-alone or ESE slave) all come standard, along with separate source selection for control room and studio plus built in talkback. You can even order the D-70 console with a SUPERPHONE module to support two callers with automatic digitally generated mix-minus. Both digital and analog line selector panels are also available.



THE D-70 DIGITAL AUDIO CONSOLE—benefit from WHEATSTONE's experience—at an AUDIOARTS price!