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Page 4

Page 41



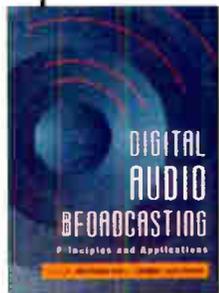
Radio World

The Newspaper for Radio Managers and Engineers

August 1, 2001

INSIDE

ENGINEERING



▼ Rick Barnes reviews the book 'Digital Audio Broadcasting — Principles and Applications' in *Transition to Digital*.

Page 14

▼ Tom Ray says it's time to bring sanity back to streaming.

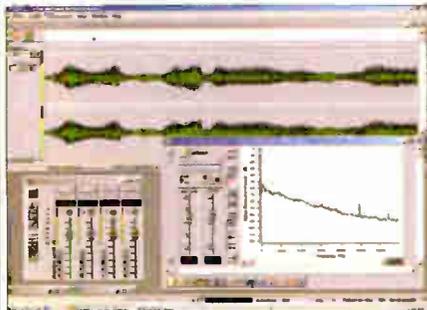
Page 10

STUDIO SESSIONS

▼ HHB Circle 3A Nearfield Monitors, Cedar's De Noise tool and increasing your PC's audio processing speed.



In This Issue



SUPERIOR POWER



▼ A lucky reader wins a Stabiline UPS from Superior Electric in our Silver Sweepstakes.



Page 4



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NEWS ANALYSIS

California Stations Dodge Blackouts

Radio Station Managers in Western States Face Staggering Power Bills and Are Forced to Conserve

by Randy J. Stine

LOS ANGELES Hoping to avoid the California "blackout bug" for the rest of the summer, broadcasters here have readied auxiliary power plans and lobbied state government to spare themselves the

most painful aspects of this summer's energy crisis.

Most experts contacted by RW said the impact of the energy squeeze on broadcasters has been minimal. However, with the reliable, consistent and affordable

See POWER, page 3 ►



Scott Petersen, KFMK(FM), Chico, Calif., reflects the feelings of many power users.

One City, One Big RF Headache

Frequency Coordination Fees Are Part of Planning For Salt Lake Olympics

by Leslie Stimson

WASHINGTON At the upcoming 2002 Winter Olympic Games in Salt Lake City, broadcasters, teams and anyone else using coordinated and assigned radio frequencies during the games will pay for that right.

Frequency coordination is a must for such large events, but this is the first time such fees will be charged.

Mario Hieb, RF coordinator for the Salt Lake Organizing Committee for the games, said the fee — \$250 per assigned frequency — serves two purposes: to keep a level playing field among frequency users, and to prevent applicants from "warehousing" precious spectrum in an attempt to ensure clean, available signals. A sticker fee of \$10 per device will also apply.

SLOC is the frequency coordination arm for the Olympics. It categorizes RF sources as being inside or outside certain boundaries, or "fences," at each venue.

See OLYMPICS, page 6 ►



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◆ NEWSWATCH ◆

Arbitron Spells Out RADAR Plans

In its first acquisition as a public company, Arbitron has purchased the RADAR radio network audience survey from Statistical Research Inc. for \$25 million, payable over two years.

RADAR, Radio's All Dimension Audience Research, measures audiences to radio commercials aired on 20 radio networks operated by ABC, American Urban Radio networks, Premiere and Westwood One.

More than once in the past, Arbitron considered duplicating a RADAR-type survey, but could not make a viable business model, said Arbitron President and Chief

Executive Officer Steve Morris. He said RADAR sales are about \$9 million a year.

As part of the deal, Arbitron gets SRI's processing software used to produce the network radio ratings database and the RADAR PC 2010 desktop application used by networks, agencies and advertisers to analyze the RADAR audience data.

SRI will work with Arbitron to adapt its processing software to the Arbitron diary survey method. SRI uses telephone surveys in combination with the spot clearance system.

Both Arbitron and RADAR employees will study the differences in response rates for both the phone and diary methodologies to see how the change from the former to the latter would affect

the RADAR product.

Morris said the acquisition allows Arbitron to get into audience measurement for the national radio business, which it sees as a growth opportunity as the number of radio networks increases.

"National advertisers are willing to pay a higher cost per rating point for commercials run on RADAR-rated networks in part because the audience estimates are based on the commercial clearance system that is an integral part of the service," stated David Lapovsky, executive vice president of worldwide research for Arbitron. RADAR employees will report to Lapovsky.

Long-term, Arbitron plans to increase the sample size for the RADAR survey using local market diaries.

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 setup system.

Plug-in modules let you have any combination of mic, analog or digital line inputs, and four stereo busses give you plenty of flexibility (each has both digital and analog outputs). And with sample rate conversion on all the digital inputs plus

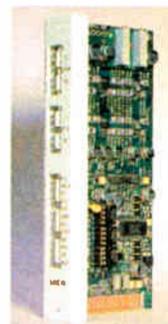
selectable console clock rates of 32, 44.1 or 48KHz (and an optional external house sync) the D-70 can fit right in with all your facility's present equipment.



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 control room and studio source selection plus built in talk-back. 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!



Twenty-one "core" RADAR employees become permanent Arbitron employees with the purchase and will remain in Westfield, N.J., according to Morris.

SRI principals Gale Metzger and Gerald Glasser will continue their SRI roles with Arbitron during the transition.

With the acquisition of RADAR, Arbitron adds Premiere Radio Networks as a new customer, while it continues talks with Premiere's parent company Clear Channel over local radio ratings contracts.

The acquisition does not affect SRI's deal to provide audience research to Sirius Satellite Radio and XM Satellite Radio, Morris said, because those agreements are not RADAR-related.

KDAP Fined \$15,000

The licensee of KDAP(AM), Phoenix, has been fined \$15,000 for various technical rule violations including failure to provide a copy of the station's antenna measurements during an inspection and failure to conduct annual equipment performance measurements.

The FCC's San Diego Field Office inspected KDAP after receiving information from the Enforcement Bureau's High-Frequency Direction Finding

See NEWSWATCH, page 6 ▶

Index

FEATURES

- Creating a New Type of Broadcaster**
by Eric Shoars 8
- Bring Back Sanity to Streaming**
by Thomas R. Ray III 10
- Book Explains Digital Audio Broadcasting**
by Rick Barnes 14
- Workbench: Cords, Columns & More Ground Rods**
by John Bisset 17

GM JOURNAL

- Salt Institute Evangelizes Radio**
by Carl Lindemann 20
- Radio Ads Get Multi-Media Push**
by Ken R. 20
- Boomers Will Break Set Formats**
by Vincent M. Ditingo 22
- Inside Ideas for a Hot Radio Campaign**
by Ken R. 26

STUDIO SESSIONS

- HHB: Big Sound in Tight Spaces**
by Carl Lindemann 33
- Optimize Your PC for Digital Audio**
by Bruce Bartlett 33
- Product Guide** 35
- Pump the Volume, Not the Noise**
by Ken R. 38

BUYER'S GUIDE

- Facility Fulfills Growth Needs**
by John Kennedy 41
- Mager Outfits Purdue Stations**
by Michael Gay 42

OPINION 54

Power

► Continued from page 1
delivery of electricity vital to studios and remote transmitter sites, the threat of additional "rolling blackouts" this summer remained a concern, especially with the state's public utilities struggling to meet the growing summertime demand.

The crisis also has raised longer-term questions for broadcasters about the availability of reliable power.

California's recent measures are meant to conserve power when energy usage is highest to prevent unexpected shortages. The California Independent Systems Operator, a nonprofit agency that manages the state electrical grid, predicted more than 30 days of rolling blackouts through this summer.

Skyrocketing costs

Even those broadcasters lucky enough to avoid blackouts are paying a price.

Skyrocketing energy costs have cut into station profits. Some broadcasters have seen their energy bills nearly double this year, said Stan Statham, president of the California Broadcasters Association.

Statham said most broadcasters have received exempt status from planned outages from the California Public Utilities



Art Lebermann runs a load test on the batteries for the 275-kW diesel generator at KGO(AM), San Francisco.

Commission. The state's energy blueprint allows some customers to be classified as "essential customers," not subject to the blackouts.

Along with broadcasters, emergency service agencies, hospitals and telephone system operators are exempt. Only eligi-

ble for the special exemptions are customers of the state's three largest utilities: Pacific Gas & Electric Co., Southern California Edison and San Diego Gas & Electric.

According to the California Public Utilities Commission, "Any customer who can demonstrate clearly that rotating power outages are likely to pose a significant threat to public health or

safety" can apply. The deadline for applying was in June.

However, Statham said the exemption is not necessarily a guarantee broadcasters will stay online.

"We have heard of a broadcaster backlash of sorts. The utilities figure if you have a generator, then you are a candidate for a blackout."

He said California Gov. Gray Davis proposed a bill that would reimburse broadcasters for any cost associated with running their backup generators.

Statham said many radio stations in his state began preparing for potential power problems early this year after forecasts by state utilities predicted summer shortages were inevitable.

Short outages

Scott Petersen, chief engineer for Regent Communications' four station group in Chico, Calif., said several of his stations have experienced several days of short outages since April, but thanks to propane generators, the stations lost minimal airtime.

"Radio stations live on electricity. That is what we are. The availability of power is critical. You can sometimes forget that until you go without," Petersen said.

Testing of generators is the most important part of any backup power plan, Petersen said.

"I've been let down because of a simple bad battery. Maintenance is the key.

See POWER, page 5 ►

Pacific Gas and Electric Company offers the following tips to its small-business customers to help them reduce their energy use and save money:

Office Equipment

- Turn off PCs, monitors, printers, copiers, and lights every night and every weekend. If you can't turn off the whole computer, turn off the monitor and the printer.
- When purchasing PCs, monitors, printers, fax machines and copiers, consider models that "power down" after a user-specified period of inactivity.
- If appropriate, use laptop computers — they consume 90 percent less energy than standard desktop computers.
- If appropriate, use ink-jet printers — they consume 90 percent less energy than laser printers.
- Implement paper-reducing strategies such as double-sided printing and reusing paper.
- Use e-mail instead of sending memos and faxing documents.
- Purchase appropriately sized copiers for your company's needs.

Lighting

- Retrofit T12 lights with magnetic ballasts to T8 lights with electronic ballasts.
- Retrofit incandescent light bulbs with compact fluorescent lights.
- Consider removing excess fluorescent lights and installing reflectors.
- Install motion detectors to control lighting in frequently unoccupied areas, such as restrooms and copy rooms.
- Retrofit incandescent or fluorescent exit signs with long-lasting, low-energy LED exit signs.
- Clean dusty diffusers and lamps every 6-12 months for improved lumen output.
- Rewire restroom fans to operate with the lights.
- Remember that dark walls require more power to produce the same amount of light.

HVAC

- Consider replacing old HVAC systems with new energy-efficient systems.
- Install time clocks or setback-programmable thermostats to maximize efficiency.
- Install locking covers on your thermostats to prevent employee tampering with temperature settings.
- Perform scheduled maintenance on units including cleaning condenser coils, replacing air filters regularly, and checking ducts and pipe insulation for damage.
- Clean condenser coils and replace filters regularly.
- Install ceiling fans.
- Install blinds, or solar screen shades to cool the office.
- Install reflective window film or awnings on all south-facing windows.
- Close shades or blinds during early morning and late evening to reduce solar insulation heat gain.
- Consider installing an air conditioning economizer to bring in outside air when cool outside.
- For optimal energy savings, set thermostats at 78 degrees F for cooling in the summer and 68 degrees F for heating in the winter.
- Install ceiling and wall insulation.
- Insulate water heaters and supply pipes.

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Engineering Legends to Speak

I hope you'll join me at The NAB Radio Show in New Orleans next month for a splendid panel discussion.

Owners, managers and engineers will enjoy spending an hour with some of the finest minds in our business. Several recent winners of the NAB Radio Engineering Award will talk with us about digital radio, broadband, radio technology, their personal innovations and the state of the industry in a roundtable that I will moderate.

These are among the most successful, opinionated, pioneering engineers in radio today. Already confirmed to speak are Mike Dorrrough of Dorrrough Electronics, Arno Meyer of Belar Electronics Laboratory, Charlie Morgan of Susquehanna Radio Corp. and Bob Orban of Orban/CRL. One or two other award winners are expected to join us.

My hope is that you are already planning to attend the convention Sept. 5-8 or that this will help entice you to come. The panel is set for Thursday, Sept. 6, from 9:30 to 10:30 a.m.

★ ★ ★

Speaking of NAB: If you have a good idea that you've been talking about with your radio colleagues, here's a way to put your concept "out there."

Anyone interested in submitting proposals for next spring's big NAB show is invited to visit the Call for Proposals Web Site at www.nab.org/scitech/convsseminar/nabconference/2002/cfp2002.asp.

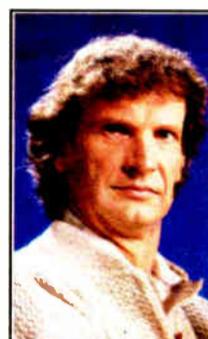
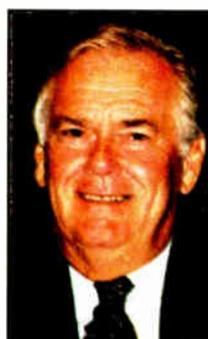
The convention will be held in Las Vegas April 6-11. Proposals are due by Oct. 22, 2001, and early submission is recommended. Ideas for the Broadcast Engineering Conference are welcome.

If you have any questions or would like more information, contact NAB Science & Technology Vice President John Marino via e-mail to jmarino@nab.org.

★ ★ ★

As a recovering EMP (E-Mail Pig), I

tried to get away from the e-trough during my vacation this summer. I set up an "auto reply" function on my incoming e-mail box. Being a smart Pig, I also unsubscribed to all the listservs and chat groups to which I belong, so my colleagues around the country would not be bombarded by my auto reply saying I had run off to Hawaii.



The Radio Show panel will include engineering legends Mike Dorrrough, Arno Meyer, Charlie Morgan and Bob Orban.

Unfortunately I missed one, the excellent "Water Cooled" newsletter of SBE Chapter 124 in northwestern Oregon. The members suffered as a result.

When my mailbox received the latest newsletter, it sent an auto reply to everyone on the server. Which of course includes me. Having received my own auto reply, my computer dutifully sent another auto reply to everyone on the server. Which of course includes me.

You get the idea. Eighty or 90 messages later, most members of that group were ready to fly out to Oahu to throttle me in person.

Lesson learned: track your listserv subscriptions. Or don't use auto reply.

PS — One engineering friend chuckled at my story.

"You're certainly not the first one to do that. When I see a whole stack of same-size messages from the same source in my mailbox, it is a simple and quick thing to nuke them all. Anyway, it probably only cheesed off the guys that check e-mail on their Web-enabled PCS phones."

★ ★ ★

The BBC decision this summer to cease shortwave transmissions to certain areas including North America reflects a broader debate among international broadcasters about the most appropriate way to reach audiences in the 21st century.

From the Editor



Paul J. McLane

this continent and hundreds of thousands in the Pacific want continued shortwave service. Other international broadcasters clearly are ready to step in to fill any shortwave void. And with the promise of digital broadcasting not fully explored, is the BBC move really wise?

I feel shortwave will have an important role for many years, but the BBC decision is an acknowledgement of hard-nosed economic reality.

This decision isn't the culmination of the controversy; it's just the start. Look for other organizations to follow suit. What do you think? 🌐

Critics are vociferous. A group named the Coalition to Save the BBC World Service called on the BBC to halt its move, saying 1.2 million listeners on

Reliable power has never been more important to radio stations. This week's prize in our Silver Sweepstakes is timely: It's a Stabiline Model SW1000 Uninterruptible Power Supply from Superior Electric.

This unit is suitable for mission-critical studio electronics. It is a 120 V, 60 Hz single-phase UPS rated for 1,000VA/670 watts. Interactive technology provides voltage regulation, transient voltage suppression and battery backup in the event of power failure. It has features such as hot-swappable batteries, cold start and selectable extended input ranges. Retail value: \$665.

The winner of the SW1000 is Jeff Diamond, a producer and DJ for KDVS(FM) at the University of California in Davis.

I continue to be impressed by the quality of the prizes given away by our advertisers during our year-long celebration of IMAS Publishing's 25th anniversary. Did you sign up? Go to www.rwonline.com. There are plenty of super prizes still in the prize closet.



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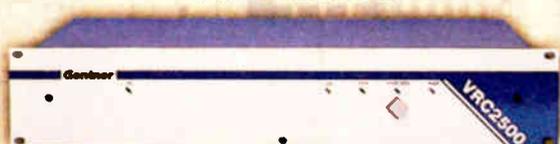


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Power

► Continued from page 3

Keep them running, or be forced to buy a new one in a pinch."

Petersen said sometimes a \$20,000 generator in the engineering budget "can look excessive" to station management.

Several engineering sources estimated the cost of a 60-kW diesel generator at \$15,000 and up. Propane generators typically are a bit less expensive. Add to that another \$3,000 for the cost of transferring from one power source to another, they said.

Jim Balcom, CE for Sacramento's KYMX(FM) and KZZO(FM), said his station prep included making sure uninterruptible power supplies on critical computers were up and functioning.

"In particular for on-air studios and traffic departments. Since the whole building is not on the diesel generator, a lot of the office stuff will go dead," Balcom said. "In addition, the microwave room and rack room are online if the power quits."

Neither station has had power interrupted, but they are prepared, Balcom said. "We have 300-gallon diesel tanks and generators at the studios and two transmitter sites, so we could run almost four days without refueling if need be."

Balcom said that, depending on the utility company, some stations are better off than others. "Fortunately, we are not a part of a large utility like PG&E or Edison. They are the ones with the most problems," he said.

Sacramento Municipal Utility District supplies power to Infinity Broadcasting's Sacramento group.

The Sutro Tower near San Francisco and Mount Wilson near Los Angeles are the two largest multiple-antenna locations in the state. Neither of the sites has suffered power interruptions, said Mark Powers, spokesman for the California Broadcasters Association.

San Francisco AM stations KGO, KSFO and KMKY use the Sutro site as a relay point for their two-way radio systems, said Art Lebermann, chief transmitter engineer for the ABC Radio trio.

Power disruptions

Lebermann said the three stations' transmitter sites around the Bay Area have seen several disruptions in power since April.

"We have focused great attention on our remote transmitter sites, which run the same risk as on-air studios of being targeted for a rolling blackout," he said.

Along with worrying about power shutdowns, engineers have noticed minor fluctuations in service, Lebermann said.

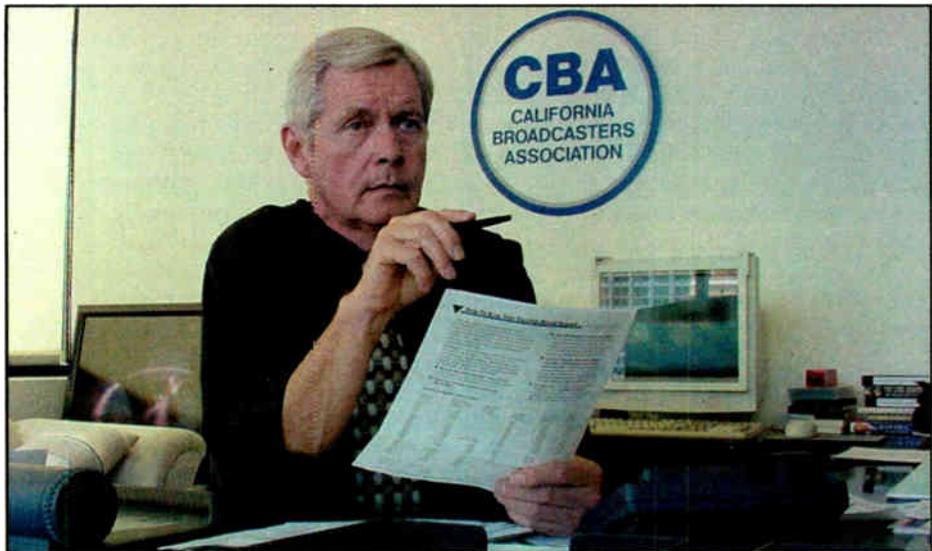
"All modern designs are well-protected with overload monitor circuits. We run all other critical equipment, like remote control and STL receivers with small UPS units just in case," he said.

Lebermann, who also is chairman for the Bay Area's SBE chapter 40, said California's experience with natural disasters, including earthquakes, has meant broadcasters were better-prepared for this summer's scheduled power outages.

"Broadcasters, particularly in the Bay Area, have learned valuable lessons from earthquakes. 'Be prepared no matter the cost,'" he said. "That means monthly testing of generators and UPS on all critical computers as a necessity to maintaining business as usual."

Chief engineers interviewed for this story all agreed on one thing — power conservation is critical. Most said the current power crisis in California will not immediately cause long-term planning

duce more than they can use, they can in theory sell it back to the energy companies," he said. The idea was discussed at the California Broadcasters Association annual convention in June.



CBA's Stan Statham

for additional facilities. They point out that broadcasters, unlike those in the manufacturing sector, cannot simply move to another state with a cheaper and more dependable power supply.

"We have tried to tell people to turn off computers and monitors when they are not needed. We have cut back on the lighting a bit. We try to power down as many things as we can when we can," Lebermann said.

Power spikes

Sandy Gamblin, Clear Channel Communications/Bakersfield GM, said his company's electric bill is nearly 50 percent higher than a year ago.

"It's a big number. You can't do without it though. Long-term, it's a major concern," Gamblin said.

"We have seen our bills climb an average of 30 percent," said Mary Lou Gunn, Clear Channel Communications/Fresno market manager. "It's hard to conserve when it's 110 in Fresno. You try to keep your people and equipment cool," she said.

Gunn said her typical monthly energy bill for the group's seven stations has increased by "thousands of dollars a month. And we expect rates to go higher still."

Mike Glickenhous, Clear Channel Communications/San Diego market manager, said his group's move earlier this summer into a new, "energy-friendly" facility should help to reduce the cost of running seven radio stations.

"Before the move-in, I'd say we were averaging electricity bills 20 to 40 percent higher than last year at the old locations," Glickenhous said.

"There are a few things we can do with the new building that should lower the bill a bit."

The California Broadcasters Association is asking its members, 105 TV stations and 653 radio stations, to send in copies of their electric bills from June 2000 and June 2001 to allow the association a chance to examine the differences.

"We already have engineers predicting huge increases. It is really frightening. We are taking it very seriously," Statham said.

Statham said several stations have showed interest in selling back excess electricity to the utilities during rolling blackouts if they persist.

"If we have broadcasters generating electricity during a blackout and they pro-

California is not alone with its concerns over the nation's power grid.

"We are looking at ways for broadcasters to cut energy consumption and costs," said Mark Allen, president and CEO for the Washington State Association of Broadcasters, which represents nearly 60 radio broadcasters with more than 200 stations in the state.

"The Pacific Northwest has always been conscious of the environment. To the extent they can, broadcasters are willing to make efforts to conserve. Conservation

is the rule of thumb," Allen said.

Washington state broadcasters are running public service announcements and offering tips on how to conserve as well, Allen said.

Several broadcast engineers in electricity-starved California said the energy crisis may have one added benefit — managers are now aware exactly what condition auxiliary power generating systems are in.

"Let's face it. A diesel generator can cost thousands of dollars, yet you hope you never have to use it. But now at least we have been put under some pressure to be better-prepared," one engineer said.

Facility investment

Lebermann pointed to the benefits of new and more efficient transmitters, in particular replacing old tube-type transmitters with solid-state. They are vastly more energy efficient, he said.

"In a sense, rather than the power crisis causing people to defer investment, which may be true in some other industries, this in fact may encourage broadcasters to invest in new, more efficient equipment for their facilities," Lebermann said.

As of late June, California had experienced six days of rotating power outages since the beginning of the year, according to California's Public Utilities Commission. Most lasted approximately one hour and affected different parts of the state. The California Independent System Operator resorts to rolling blackouts only after the state's electricity reserves fall below 1.5 percent.

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► Continued from page 6
 demands a deregulatory response. In our view, the proponents of deregulation and consolidation have yet to prove their claims. Deregulation without reasoned justification is nothing more than deregulation for its own sake. We have already been down that road and we have seen the troubling results in the radio marketplace.
 "We must not make a similar mistake by further consolidating ownership of our local television stations. ... Despite the proliferation of the Internet and the increased deployment of digital cable and satellite television systems (with hundreds of programming options), most people still get their information from local newspapers, radio and television stations."

Powell: Time to Redraft EEO

WASHINGTON FCC Chairman Michael Powell says he's disappointed that a D.C. federal appeals court in June denied the FCC's request for a re-hearing on its EEO rules, which were struck down in January as unconstitutional.

Of the rule's two compliance options, the FCC asked to court to preserve the one that would have required stations to provide job notices to any group that requested them. Most stations would have been required to choose four of 13 recruitment initiatives.

In January, the court had no problem with this option, but because a second option was deemed unconstitutional, the entire EEO rule was struck down.

Stations could have designed their own recruitment programs under the second option, which the court said was a de facto, unconstitutional quota system.

Powell intends to recommend to his new fellow commissioners that the agency re-craft the broadcast and cable EEO rules "in a manner that complies with the judicial limitations of the Constitution, and that are not unduly burdensome on the industry."

Speaking before the Federal Communications Bar Association, Powell also said he intends to explore ways to improve minority broadcast ownership. He supports Sen. John McCain's revised tax credit bill, a revised version of the previous minority tax certificate program, killed by Congress in 1995 for alleged abuses.

Hoelzel Dies At 56

MEDFORD, N.J. Bill Hoelzel, former vice president of QEI Corp. died of heart failure in June. He reportedly had completed a bicycle marathon before he died.

The 56-year-old was one of the co-founders of QEI, along with President Charlie Haubrick and John Pilman. Most recently he worked for Verizon.

Hoelzel worked at QEI for 21 years and he's credited as one of the forces driving QEI toward solid-state transmitter development.

He left the company in 1993 to start his own business in Mt. Laurel, N.J., called Eastern Sports Specialists.

XM's Patsiokas Promoted

WASHINGTON XM's Stelios "Stell" Patsiokas, senior vice president for Technology, has been promoted to oversee all of XM's technology and engineering efforts.

"Stell has done an amazing job completing the XM chipset and XM radio development working with all of our technology partners, and has been focusing his attention on preparing for commercial launch this summer," said XM President and Chief Executive Officer Hugh Panero.

Dr. Patsiokas earned recognition during his 19-year tenure at Motorola for his technical expertise developing wireless communication technology products, including the first synthesized scanning receiver, the first digital handset and the first two-way pager with an operating system. He is described as an expert in radio frequency propagation and digital modulation.

Patsiokas assumes his additional duties from satellite executive Jack Wormington, who recently moved to Boeing Satellite Systems now that the orbiting platforms have been launched. At Boeing, Wormington will continue to monitor XM's satellite program.

NAB Radio Board Full

WASHINGTON Four broadcasters have been appointed to fill vacancies on the NAB Radio Board of Directors.

The new appointees are:

Jerry Hanszen, owner/GM of KGAS(AM-FM), Carthage, Texas for District 19 (Oklahoma and northern Texas); Val Maki-Candido, VP/GM, KPWR(FM)/KLAC(AM)/KZLA(FM) in Los Angeles for District 24 (southern California, Guam, Hawaii); Stephen Levet, GSM, WCKW(AM-FM), Metairie, La., for District 8 (Louisiana and Mississippi).

Alfred Liggins, president/CEO of Radio One Inc., has been named to fill one of the designated board seats representing major markets. ●

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 Your remote equipment toolbox may already include ISDN and POTS codecs plus a slew of other stuff. Now they are talking about high speed GSM digital wireless — and coming soon...3G.

The Matrix's modular approach is designed with this future in mind. The core of the Matrix's flexibility revolves around full access to its powerful coding engine through easily inserted modules and upgradeable flash memory. Whatever may be coming down the communications pipeline, the Matrix is ready.

THE CODEC FOR TODAY

WIRELESS

- 5 kHz real-time, full duplex audio on GSM wireless phones
- Up to 10 kHz real-time, full duplex audio on HSCSD GSM
- 15 kHz real-time, full duplex audio on portable Inmarsat terminals (with optional ISDN module)
- 15 kHz nonreal-time, "Store and-Forward" feature may be used on many mobile circuits
- Optional battery kit delivers power for up to 7 hours

ISDN*

- Layer III for 15 kHz at 64 kb/s
- G.722 for wide compatibility with other codecs
- Turbo-G.722 for 15 kHz with only 6 mS of delay
- Layer III transmit with G.722 return to reduce delay
- 1200 baud ancillary data available
- Fully international terminal adapter works worldwide

* ISDN module required

POTS

- 15 kHz full-duplex audio on a standard telephone line
- Available in portable or rackmount versions
- Modular design enables use on future circuits
- Will work at data rates as low as 9600 baud
- "Store and Forward" allows 15 kHz, nonreal-time audio transmission at any data rate

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FIRST PERSON

Creating a New Type of Broadcaster

Eric Shoars

This is one of a series of occasional articles about programs that teach radio broadcasting.

As the radio industry continues to evolve, so must college programs to prepare the next generation of broadcasters.

The Radio Broadcasting program at Riverland Community College is not only training the next generation of broadcaster but creating a new type of broadcaster.

Here's a look at how our school prepares students for the world of radio.

New entity

Riverland Community College is located in Austin, Minn. — population 22,000 and the birthplace of SPAM luncheon meat — about 100 miles south of Minneapolis.

The college has been in existence since 1995, the result of a merger of three schools by the Minnesota State Colleges and Universities System.

They were Minnesota Riverland Technical College-Austin; Austin Community College; and South Central



Student Tina Knudson works at KERC's Radio Systems console.

Technical College-Albert Lea.

The Radio program itself has been in existence since 1972 and has yearly enrollment of 20 students. This allows students an intimate learning experience, with a low student/instructor ratio.

Radio Broadcasting majors have

choices as to the careers for which they will be trained. The radio program has two one-year diploma tracks, and a degree track requiring two years of study. This approach allows students to tailor their education.

The first diploma track is a 35-credit

program called "Radio Generalist." Students take core radio courses as well as electives relevant to their career interest. This will prepare students to work as air personalities, copywriters, commercial producers and newscasters.

The second diploma track is a 39-credit program called "Radio Broadcasting Support Specialist." I created this track in partnership with Randy Randel, general manager of supplier Computer Concepts Corp., in 1999. It is the only program of its type in the country.

Students take core courses in radio and Microsoft networking. Graduates have the same skills as those in the Generalist track, with added qualifications to work as a radio station computer networking person.

Talent pool

The RBSS track also provides Computer Concepts with a talent pool from which to hire employees. The company needs people with a background in radio and computer networking to work as customer support representatives. Thus the program benefits our students, the college and this employer.

Maestro is a digital audio management workstation, the flagship product of Computer Concepts. The company has provided Riverland with four Maestro units for use in our simulated and on-air studios. Our partnership with Computer Concepts has allowed the radio program to offer its students state-of-the-art broadcasting facilities.

The degree option is a 72-credit A.A.S. degree in Radio Broadcasting. Students from either of the diploma tracks can put their credits toward the A.A.S. degree. Students in this track take courses in radio and also complete the liberal arts courses necessary for their degree.

Graduates from the degree track will have skills gained from their diploma program combined with advanced radio principles included in such courses as The Program Director, Broadcast Law and Radio Station Management.

Riverland radio courses are part-theory and part-hands on, favoring the latter. I determine course content. Offerings are added to the radio curriculum with input from the program's advisory committee and approval of the curriculum review committee.

Radio broadcasting students receive practical experience in on-air broadcasting and radio station operations through

See RIVERLAND, page 12 ▶

Riverland Course Offerings

Radio Generalist

Radio Lab
Radio Operations I
Intro to Maestro
Intro to Audio
Radio Production
News Writing
Internship
Written Technical Communications
Introduction to Computers
Speech for Performance
Principles of Marketing
Additional elective credits: 9

Radio Broadcasting Support Specialist

Similar to above, plus:
Windows 2000: Professional
Windows 2000: Server
Windows 2000: Administering
Directory Services
Windows 2000: Network
Infrastructure

Radio Broadcasting A.A.S

Radio Operations II
Broadcast Apprenticeship
The Program Director
Broadcast Law
Radio Station Management
Freshman English
General Education Credits: 18
Technical Electives: 19

Texts used include "The Radio Station" by Michael Keith; "Audio in Media" by Stanley Alten; "Management of Electronic Media" by Alan Albarran; "Communications Law" by John Zlezny; "Future Sell" by Godfrey and Ashley Page Herweg; "Radio Programming: Tactics and Strategy" by Eric Norberg; "Writing and Reporting News: A Coaching Method" by Carole Rich; and "Copywriting for the Electronic Media" by Milan Meeske.

Two studio simulators have Maestro digital audio management systems from Computer Concepts Corp.; two others use cart decks. Simulators are equipped with mixers by ATI, Mackie and Autogram; Sony MD JE630 MD player/recorders, TEAC CD players; Tascam reel machines; and ITC cart decks.

The production studio is equipped with an Arrakis 2000 SC control board, Otari reel to reel, Optimus CD players, Sony MD deck, Technics cassette deck, Maestro system and a Windows computer loaded with Cool Edit Pro, Log Merge and Music Pro 6 music scheduling software.

The KERC on-air studio is equipped with a Radio Systems Millennium control board, Maestro digital audio management system, Optimus compact disc players, a DTN color weather radar, and an Otari reel to reel.

Talk Power

Clark Howard is the consumer champion who has powered up a whole new category and audience for talk radio. And he's an example of how, with Cox Radio, Jones Radio Networks delivers radio power.

Call Amy Bolton, JRN News & Talk, 800.611.5663.

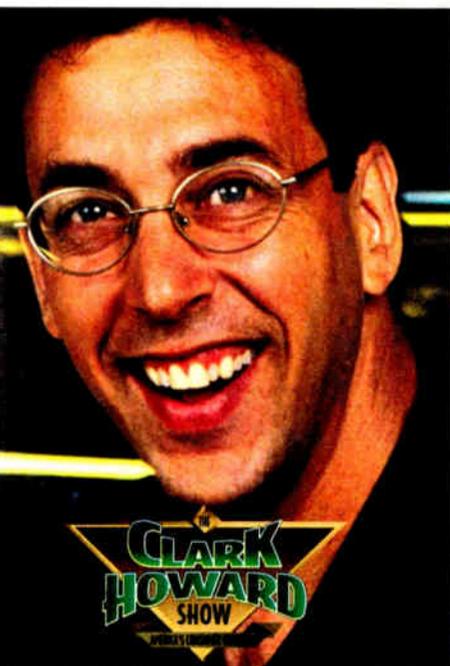


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COX
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Introducing Omnia-3, the all-digital audio processor that offers all the clarity, punch and raw power of the original Omnia. At an amazingly affordable price.

Omnia-3 includes standard features not found anywhere else—like 48kHz sampling, three-band processing, digital audio inputs and outputs, integrated composite clipper, and a removable PC card that simplifies software changes.

Impressive features aside, it's the sound that will blow you away. No other audio processor sounds as good as Omnia. That's why leading broadcasters the world over choose Omnia to boost ratings and crush the competition.

For this much power—on the dial and in the marketplace—you'd expect to pay twice the price. But now, you don't have to.

With Omnia, you lead. And others follow.

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Omnia is used in 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.

*\$3,880 (US) MSRP for Omnia-3fm model. Prices may be slightly higher outside the U.S. due to duties, freight and other costs.

World Radio History

GUEST COMMENTARY

Bring Back Sanity to Streaming

Thomas R. Ray III

The author is corporate director of engineering for Buckley Broadcasting/WOR Radio in New York.

Radio World Editor Paul McLane wrote in the May 9 issue about stations pulling their Internet streams. He wrote, "The hasty action by radio groups that yanked their streamed programming recently strikes me as short-sighted."

This makes it sound like the stations in question, and WOR is one of them, did not give this decision much thought and simply pulled the plug. This is not

the case.

Most of the commercials in question were agency spots. Obviously, the agency made the deal to get the spot(s) recorded, paid the appropriate fees, and delivered the spot(s) on behalf of their clients. The agency was then told that they owed additional expenses if the spot(s) were streamed. Stations started receiving letters from agencies threatening to cancel advertising contracts if the spots were streamed.

With the threat of loss of revenue, WOR and the Buckley stations pulled their streams.

AFTRA wants payment for additional

exposure for their talent (as explained on www.aftra.com), and rightfully so.

However, according to their example of a New York City station, the talent would be paid \$1,317.40 for a spot that would air for a year in the New York market, with a potential listenership of 14 million persons. If a station streams its audio, the talent would be paid an additional \$660 because the potential listenership and exposure for the talent is worldwide.

AFTRA goes on to state that this is a "discount" from what the fee should be due to the worldwide nature of potential listenership. What they don't take into

consideration, however, is that most Internet streams have a limit.

WOR, although on a large server, was limited to 1,500 streams at any time. Our on-air signal has upwards of 500,000 persons listening at any given time. How can \$660 be justifiable for a grand total of 1,500 persons listening?

While most stations, WOR included, had listeners to their streams on a worldwide basis, I doubt that these streams generated any additional revenue for the stations in question. If anything, they may have resulted in TSL going up slightly, as persons who could not listen to a station, particularly an AM, in an office building now had the opportunity to listen longer.

This has the potential to affect advertising rates, but Arbitron does not ask how you listen, only when you listen, and it would be hard to correlate additional TSL to Internet listening. The additional revenue, if any, generated for the station makes it hard to justify the "discounted" rate.

Ad insertion questions

AFTRA's site goes on to state that the technology exists to excise commercials from the station's Webcasts. This is true. However, in the case of WOR, this would not be possible.

WOR was limited to 1,500 streams at any time. ... How can \$660 be justifiable for a grand total of 1,500 persons listening?

When WOR is an affiliate of our own network, The WOR Radio Network, replacing a spot cluster would be simple. All of the breaks are formatted with specific lengths. The network closure comes down, the filler material would fire, all would be right with the world.

But WOR is live and local for a considerable portion of the broadcast day. The talent and producers have the authority to move spots around in an hour and, depending on program content, break length can vary considerably.

An announcer may not want to read a live spot after conducting a long interview, and what was a break with 1:00 of live content and 2:00 of recorded content becomes 3:00 of recorded content.

The technology presented to me required a download of our commercial log. From the above scenario, it becomes clear that this would not work and we would have to start programming the radio station for the Internet and become rigid. This is not acceptable.

Spot replacement under these conditions would require another operator and essentially the operation of a separate station strictly for the Internet, something that is not in the budget — and won't be for a service that generates zero revenue.

Additionally, what do you fill with? Station promos? "Smokey Bear" PSAs? Wait, Smokey is probably AFTRA and we can't do that.

See STREAMING, page 12 ▶

The Perfect Arrangement for Your Audio

Digital doesn't have to mean difficult. With Logitek, your studio wiring and configurations are beautifully simple - and completely flexible. Combine analog and digital sources easily and control them from anywhere. Centrally locate all of your audio sources, share them throughout your facility, network your audio with high speed optical connections and easily manage your audio distribution, routing and mixing.

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On The Air

A Monthly Newsletter from Broadcast Software International

Issue 6

Quote of the Month

"I want to pay compliments to your tech support. They responded promptly and helped me get through the problem."

Keith Shipman, President
Horizon Broadcasting Group-
Bend, OR

News

You're Invited to BSI on the Bayou



If you're going to the NAB Radio Show in September, put a few hours aside Wednesday evening (Sept. 5) for BSI On The Bayou. Broadcast Software International is hosting a two-and-a-half-hour riverboat cruise, aboard the elegant Riverboat Cajun Queen. The cruise will officially launch BSI's newest automation software currently codenamed "Simian" and demonstrate several other new BSI products.

BSI's Simian is the first of a new generation of digital automation solutions. Many features are still confidential; though we can tell you that Simian incorporates advanced capabilities for self-diagnosis and repair, interstation communications and streaming spot substitution. Simian is touchscreen enabled and will support tagging and simultaneous multiple playback of all professional audio file types.

We'll also be showing our new audio capture software, Skimmer, which is great for sampling jocks or any other kind of air check. Skimmer can record up to an entire year of audio, with any minute of any day instantly accessible.

If you need more than a riverboat cruise and new product demos to peak your interest, we'll also have prize drawings twice an hour for super-cool prizes from BSI and our partner companies, Syntrillium and AudioScience. (Remember to bring a business card to enter the drawing.)

You'll need to have an invitation to join us on the "big muddy" for BSI on the Bayou, so call ahead to 888-BSI-USA1 (274-8721). We'll have refreshments and some great music from southern artists. We'd really like you to join us.

Calendar

Aug 23-25, WaveStation
Weekend Training Session

Sept 5, Demonstration of a
new automation product at the
NAB. Call for an invitation.

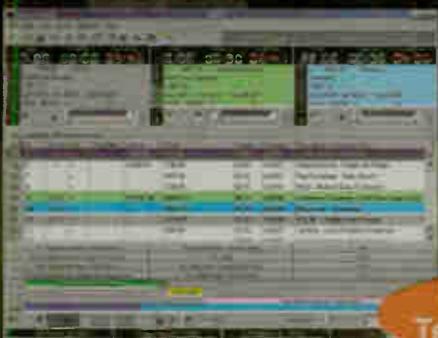
Birthdays:
Aug 25 1949, Gene Simmons
Aug 28 1982, LeAnn Rimes

Tip

On-Board CODECS

A professional audio card with an on-board codec allows the sound card to decode compressed audio files (such as MP3) directly on the card with a built-in logic chip. This is a great resource saver for the computer, as it would otherwise have to open a software codec, pass the audio files through that program and then return the uncompressed audio data to the audio card for output.

Affordable Digital Automation- Air and Production just \$1499



Free 24/7
Tech support

- Full automation, live assist or satellite
- Quadruple overlap
- Vocetracking
- Multiple station control
- Support for any audio format
- Easy interfacing with any scheduling or multi-track editing program
- Windows 2000, 95, 98, ME, NT or XP

Reliable, powerful, affordable.
Download WaveStation at
www.bsiusa.com

User File

KWDB - Rick Bell

Rick Bell in Oak Harbor, Washington has been running WaveStation since they switched on the transmitter in March of 2000. "The best thing I can say about WaveStation is that we're still learning things about it. Every time we turn around, it seems like we've discovered something new." Rick says, "We've only scratched the surface of what WaveStation is capable of doing."



Despite the number of features, just about everyone at the station knows the basics of WaveStation. "A friend of mine has another automation system, and it just seems like the learning curve for WaveStation is much shorter."

BSI has also been really responsive. "What I really like about the software and the support that you folks have is that you take input from all the users out there and you actually pursue fixing things." In an emergency, he knows he has someone he can count on. "I can't say enough about your tech support. Those guys are just it. They've gone way out of their way to help me. When they answer the phone, there's a sigh of relief on my end."

Send us your story.

888-BSIUSA1 WWW.BSIUSA.COM
Broadcast Software International

Riverland

► Continued from page 8

the program's Internet radio station, KERK, which debuted in late 1999, launched by me and now-Riverland graduate Jake Ressler. KERK is a student-run, student-driven radio station.

The studio simulators underwent an upgrade during the summer of 1999. Ressler designed new countertops, rewired equipment in all four simulators following their remodeling and rewired the production and on-air studios. He was the program's engineer and made key recommendations as to equipment purchases.

I believe that theory is nice but experience is the best teacher. My philosophy is

that this is not a college radio program so much as it is a radio station that happens to be located inside a college.

Students are treated as if they are

station. That kind of experience will have a tremendous impact on their careers. Tasks include on-air shows, music scheduling, playlist reporting, off-air produc-

tion and promotion aspects.

As a result of this approach, students believe in the program.

"Attending Riverland and choosing a program such as radio broadcasting was the wisest choice I made to get my life going in the direction I want. The opportunities are endless," said second-year radio student Tina Knudson.

Student involvement

An important distinction between this radio program and others is the level of student involvement in the overall operation of the program.

"Riverland has a radio program that you would think would be the standards that a four-year program has. I chose Riverland because I wanted to be able to 'touch' radio equipment the first day of class. I did not want to have to read the instruction manual of the CD player. The equipment is awesome," said second-year radio student Dean Lickteig.

"I have learned so much 'hands-on' experience with studio equipment, writing and recording commercials. (It) also gave me the opportunity to work on-air for a radio station in Rochester (Minnesota) at KROC(FM)," Knudson said.

I find the talent and energy these students bring to our program exciting. The next generation of broadcasters — the new type of broadcasters — is at Riverland Community College.

Fall classes begin Aug. 27, 2001. 🌐

The Radio Broadcasting program at Riverland is not only training the next generation of broadcaster but creating a new type of broadcaster.

employees of the station. They receive practical, "real-world" experience while still in college. They are not only responsible for completing assigned tasks but have direct input about the goals of the

station, promotion, Web site development and digital waveform editing.

Students chose KERK's format, designed its logo, determined on-air content and assisted in the production, mar-

The Simplest Internet Spot Substitution: Scott Sub

\$1000 Software
provide your own computer and mini-switcher

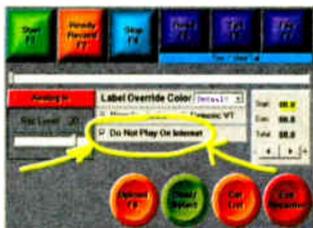
Mark Spots "No Net" in Production and They Won't Play on the Internet!



Many radio stations have been in a dilemma about their Internet streams since AFTRA started charging fees for commercials on the web. Stations want an easy way to substitute other material for AFTRA commercials.

Simply Mark a Spot "No Internet"

Scott Studios has the best answer for stations using Scott digital systems: Simply mark "Do Not Play on Internet" on any commercial in your production studio. This check box on the spot label ensures that this spot will not be fed to the web. Any Scott SS32 or AXS3 (and most older Scott Studios systems with a low cost software upgrade) can connect the Scott system to our Scott Sub.



Timing is Perfect

When any recording plays that is tagged "No Internet", the Scott Sub system's switcher cuts the net feed away from the on-air feed and substitutes approved material of the exact same length, then rejoins the air signal.

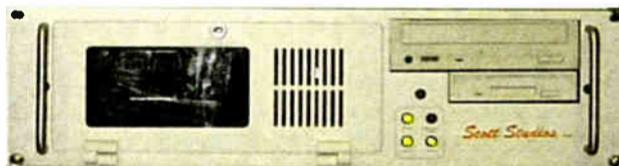
Spot Substitution is Automatic

These promos and other generic time fillers can be selected from your on-air inventory of spots and promos without extra production, recorded especially for webcasts, or any combination. To minimize work and eliminate errors, Scott Sub rotates up to 100 cuts under cut numbers that match the lengths of the "No Internet" recordings. Scott Sub honors start/end dates and times, ensuring that all material is timely, fresh and appropriate. Scott Sub easily handles complex rotation changes with no redubbing required. It

never plays out of date spots. Program length subs are also handled easily.

Play WAVE and MPEG Spots & Promos

Scott Sub plays uncompressed and MPEG II Scott system recordings with overlap from an inexpensive audio card. With our optional TLC (Trim, Label & Convert) software, you can import MP3 audio and convert it to WAVE or MPEG for play in Scott Sub.



Scott offers a preassembled system with a Pentium III industrial rack mount computer, mini-switcher, serial connections and software for \$2,250, plus shipping. Or you can get our Scott Sub software for \$1,000 and add an appropriate Windows computer, SoundBlaster X-Gamer sound card, hard drive, LAN card, Broadcast Tools SS 3.1 switcher and cables to build it yourself.

Simplest is Best

For busy radio stations, ease of use is essential. Scott Sub is the simplest Internet ad deletion and insertion unit anywhere! It works seamlessly with Scott Studios and some other digital systems.

Want more details? See our website at scottsub.com. This \$1,000 software pays for itself very quickly!

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13375 Stemmons Freeway, Suite 400
Dallas, Texas 75234 USA
Internet: scottsub.com

(972) 620-2211 FAX: (972) 620-8811
1-888-GET-SCOTT

Streaming

► Continued from page 10

Leave an empty hole in the audio when you go to commercial? How many times will a listener to your stream put up with hearing the same promo over and over?

Impossible situation

With the threat of loss of revenue and having to replace commercial content, and now not being able to stream your Major League Baseball games because the broadcast is owned by Major League Baseball, many stations are left with an impossible situation in regards to their Internet streams.

While you don't want to lose the additional listeners you may gain from your stream, it makes no sense to put up a stream that would require an additional staff to maintain.

If the stream were a moneymaker, that would be another story. But the idea of streaming for most stations was that it would be a convenience for their listeners, whether they were out of town or in a poor reception area.

It's time we brought a little sanity to the business. The deep pockets of the past are gone. I think we all need to step back, take a deep breath and look at the situation logically, from all corners.

The present solutions are not completely logical and would result in additional expenditures that can't be justified in a business model. Don't you just miss the days when radio was fun and being on the air, or on a stream, or on a PA system was considered cool?

RW welcomes other points of view. 🌐

Encore!

The Telos Zephyr is one tough act to follow. It revolutionized point-to-point audio by combining ISDN with MPEG coding, and quickly became the #1 selling codec worldwide — perhaps the most successful digital broadcast product ever. So what will we do for an encore?

Presenting Zephyr Xstream, with innovations like AAC (Advanced Audio Coding) for superior fidelity, a special low-delay mode, and an Ethernet port for IP audio streaming, remote control and easy software updates. There's also a rugged portable version with full-featured digital mixing.

And of course Zephyr Xstream includes everything else you'd expect from a Zephyr, like Layer-II and Layer-III coding, ISDN connectivity, a simple, friendly user interface, and bulletproof reliability.

Zephyr Xstream. Sometimes the sequel is even better than the original.

Telos
www.zephyr.com



BOOK REVIEW

Book Explains Digital Audio Broadcasting

Rick Barnes

A recently published book, edited by Wolfgang Hoeg and Thomas Lauterbach, provides a much-needed primer for the digital modulation of radio. Released for publication in the United States in March, "Digital Audio Broadcasting — Principles and Applications" offers many answers regarding how digital radio modulation works.

The main focus of the book is the Eureka-147 version of DAB, currently in operation in Europe, Canada, Australia, Singapore, China and South Africa, and under development in other Asian nations including India.

The in-band, on-channel form of digital radio, now in research and development in the United States, is mentioned briefly.

Many of the explanations in subsequent chapters have practical applications to IBOC, Digital Radio Mondiale and Integrated Services Digital Broadcasting, the Japanese version of digital radio, as well as Eureka-147.

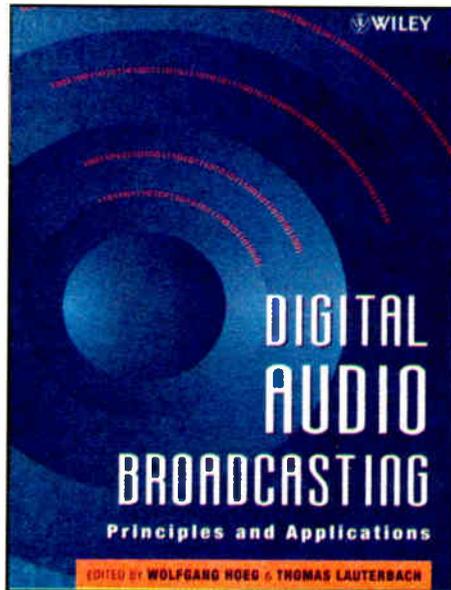
Essentials

The system concept chapter provides ample descriptions of the frame structure of DAB, interleaving and Differential Quadrature Phase Shift Keying, or DQP-SK, all of which have applications in DAB formats other than Eureka-147.

The chapter on audio services and applications provides an understandable description of audio masking techniques and the psychoacoustics of human hearing with their application to bit-rate reduction in digital radio.

The characteristics of MPEG algorithms are provided. Of particular interest is the description of error protection and concealment. The Eureka-147 version of DAB provides for an "ensemble" of audio and ancillary service in the 1.537 MHz of bandwidth of a DAB channel in this scheme. This concept is introduced

in the audio services and applications chapter and is described in detail in the following chapter.



The chapter concerning data services and applications tells the story of Eureka-147's ability to provide ancillary services in terms of multimedia transmission. These include HTML pages, JPEG pictures or slideshows and MPEG movies

of DAB main services — audio services, program associated data (PAD) and packet mode data — data services such as the dynamic label format, MOT protocol and slide shows — broadcast operating systems and editorial systems with the management of text and service data.

This chapter also speaks of the compatibility of digital audio broadcasting with the Radio Data System (RDS/RBDS) and outlines the differences and similarities between DAB and RDS. It closes with a discussion of audio services aspects concerning loudness differences within audio services, DAB/FM switching and DAB ensembles, signal level alignment, metering and control.

Technical details

"Collection and Distribution Networks" provides block diagrams of the DAB ensemble multiplexer, the layer structure of the Service Transport Interface (STI) frame descriptions and the structure of the DAB collection and distribution networks. In order for this chapter to make much sense, however, a certain level of understanding regarding computer and telecom network architecture is required on the part of the reader.

The book includes an extensive bibliography of standards and related documents, publications and links for the study of DAB.

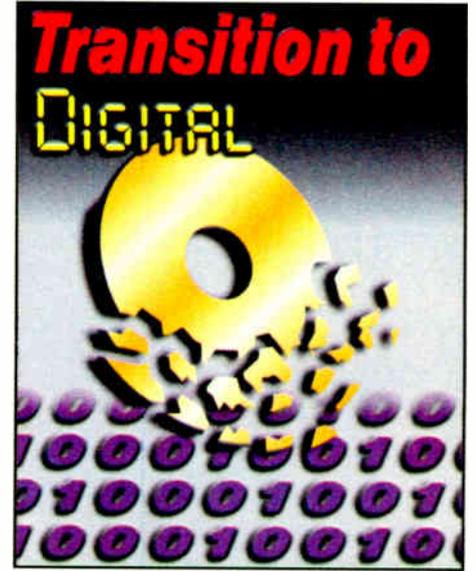
using the MOT, Multimedia Object Transfer protocol. Eureka-147 is definitely not radio as we once knew it, and Hoeg and Lauterbach's book definitely prepares us for this new and exciting technology.

A chapter titled "Provision of Services" provides a detailed description

On the broadcast side, a well-defined description of Single Frequency Networks (SFN), with their ability to provide power and frequency economy and why they are possible with DAB, is provided.

This section also describes Coded Orthogonal Frequency Division Multiplexing, or COFDM, which, again, has a direct application to IBOC technology as well as Eureka-147. Frequency management is addressed in this chapter as well as coverage capabilities and Bit Error Rate.

The book closes with a chapter on the receiving side of DAB with block diagrams of DAB receivers, channel decoder



architecture and audio decoders. "Digital Audio Broadcasting — Principles and Applications" provides an extensive bibliography of standards and related documents, publications and Internet links for the further study of DAB.

Although Wolfgang Hoeg, formerly head of division at Deutsche Telekom Berkom, and Thomas Lauterbach, a member of the faculty at the University of Applied Sciences, Nuremberg, Germany, edited it, many individuals participated in the writing of this text. The list of contributors indicates 15 distinguished engineers who provided information for the eight chapters of this book.

The book served as the primary resource for an academic paper that I recently wrote for a graduate level course in "Introduction to Digital Transmission." I am sure that I will be poring over this book for months.

If you are a broadcast manager, engineer or a student intent on being involved with radio for the coming years, I encourage you to do the same. It will serve you well.

"Digital Audio Broadcasting — Principles and Applications" is a 280-page hardcover, priced at \$75 and available from various online booksellers or from the publisher, John Wiley and Sons Ltd., Chichester, England.

Visit www.wiley.co.uk/wileychi/commstech/hoeg.html.

The book's ISBN number is 0-471-85894-3.

Rick Barnes, CBRE, is a studio engineer and Internet news specialist with the Voice of America. He is a graduate student at Capella University, Minneapolis, where he is working toward a Ph.D. in communications technology.

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monitors transmitter operating temperature
analog output for remote monitoring
programmable alarm output with relay
front panel adjustments and LED display
two air temperature sensors included
indicates failed or clogged ventilation system
early warning for antenna icing conditions

model tsn-3



Time • Temperature • ID

time and temperature delivery for automation
60 seconds of user recordable storage
automatically varies message delivery
professional male announcer voice
temperature in Fahrenheit or Celsius
battery backed AC synchronized clock
digital message storage - no moving parts

model tti-2



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perform unattended remote broadcasts
DTMF operated controller with relay outputs
fully programmable output on any key press
momentary and/or maintained relay outputs
four logic inputs with programmable output
balanced audio input and output with ALC
seven DPDT relays and one 4PDT relay

model dai-2

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MARKET PLACE

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World Radio History

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World Radio History

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Workbench

Radio World, August 1, 2001

Cords, Columns & More Ground Rods

John Bisset

Keeping things clean is the bane of the broadcast engineer.

George Sperry, general manager of WEVA(AM), Emporia, Va., was doing some preventive maintenance recently, and was washing the station building windows using one of those Windex-brand spray units that screw onto a garden hose.



Fig. 1: This wiring column in Charlottesville, Va., has a Jeffersonian feel.

After completing the windows, and with an ample amount of spray left, George turned the nozzle onto the fiberglass dish in the side yard. It cleaned the grime and bird droppings from the dish, without the need for a ladder. In about 15 minutes, both 3.5-meter dishes were clean, and looking new.

Now for a spray-on wax, to simplify removal of snow and ice when the winter

months arrive! Thanks, George, for the tip, and for sharing routine maintenance tips with engineers, even though you are a GM!

★ ★ ★

Not far from Emporia is the home of Thomas Jefferson, Charlottesville, Va. There, the Eure Communications group has kept the Jeffersonian style of architecture in its studios by designing columns that double as wire-running raceways.

Figure 1 shows one of two columns placed at the edges of the studio furniture, used to route all wiring into and out of the studio. The columns are a novel way to get the job done, and in the tradition of Thomas J.

★ ★ ★

We don't always have the luxury of locating studio furniture so that electrical access is hidden.

Brian Edwards of New World Radio solved the problem of plugs accidentally being removed by securing the cables as shown in Figures 2 and 3.

The service "loop" permits the plug to be removed, when the need is presented. Otherwise, a leg brushing along the cords won't dislodge them.

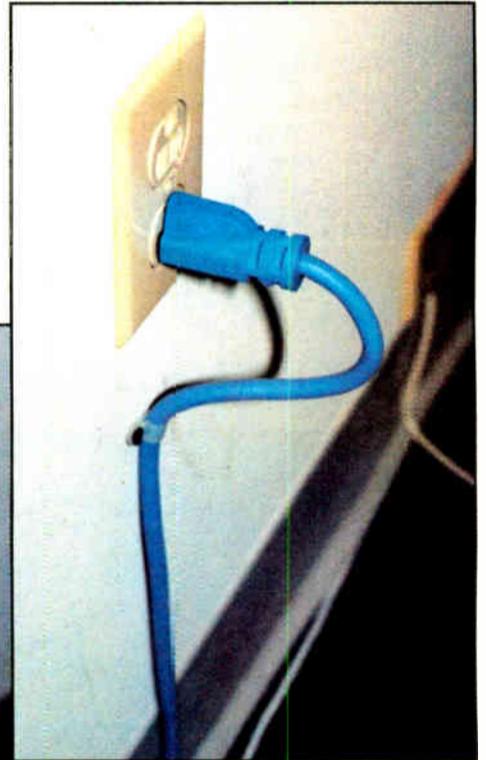
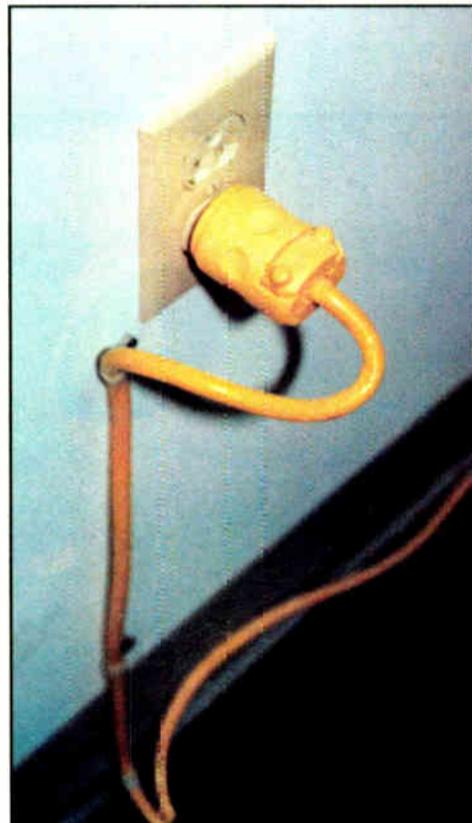
★ ★ ★

John Stortz's ground rod project has generated more response than any other *Workbench* topic. I appreciate everyone taking the time to pass on your suggestions.

Few of us have the benefit of working next to a sage engineer anymore, learning all of the tricks of the trade. That's what makes this column so special. We can all learn from one another. Keep up the great

exchange of ideas, readers.

John sent a follow-up message regarding the connecting of ground rods. It seems you can buy ground rods with the "hammer end" threaded. Two ground rods can be screwed together using a threaded coupling.



Figs. 2-3: Keep power cords secure with this simple precaution.

problem is eliminated using the threadless couplings.

Mike McCarthy has driven over a hundred ground rods over this past year. After hammering away with the sledgehammer, like John Stortz, Mike had a "pounder" made for him. It's like a pile driver, but weighs more than 50 pounds. It's good for one or two rods in light soil.

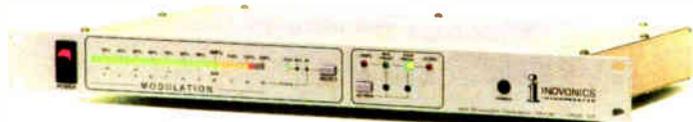
As his jobs increased, though, Mike started investing in the heavy-duty tools. Makita makes a ground rod-driving cup for its 1-1/8 demo hammers. Mike paid about \$80 for his. He also invested in bits from Bosch and Dewalt, for spline and SDS Max drivers. The type used depends on the soil and the depth. Many of these tools can be found at industrial rental companies.

See WORKBENCH, page 18 ►

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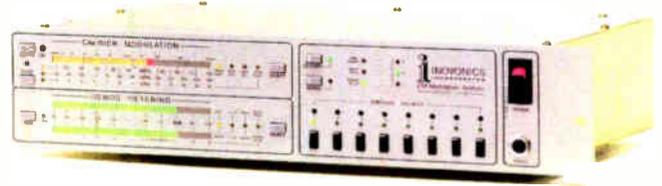
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For more information contact ERI at (812) 925-6000 or visit www.eriinc.com.



Workbench

► Continued from page 17

Mike invested in a Bosch SDS Max hammer driver for moderate soil. The tool was well worth the money, because it easily bores holes for transmission line passage in block walls.

If the soil is really hard, Mike will rent a 60-pound demo hammer and use the heavy bit from Makita. He's only had three cases where he could not drive a 3/4-inch rod the full depth.

When faced with really hard soil, the best tool combination is a two-cycle gas demo/driver from Kawasaki, again using the Makita heavy bit. Mike drove a 15-foot rod into hard clay soil in about 10 minutes. It took the heaviest electric model an hour on another rod.

Ed Dulaney at KLZ(AM)/Crawford Broadcasting in Colorado offers a simpler approach. In soft soil, Ed has used a t-post fence post driver. These are hollow steel tubes, closed on one end, open on the other. The handles welded to the closed end forms the "T."

These drivers can be used for drive the rod to a depth of 14 to 20 inches, before resorting to a sledgehammer to complete the job.

In sandy or light-density soils, a standard half-inch chuck hammer drill will work. Although this tool takes longer, it's less exhausting than slamming the rod with the T-post driver or sledgehammer.

I've saved the simplest suggestions for last. Leave it to the hams to have the lowest-cost solution. Ken Romero from KXKC(FM) in New Iberia, La., was taught this trick by some ham operators. It's a good solution for only a few ground rods.

First, take a garden hose and soak the area where the rod will go. Take the rod, and like a spear, stab it into the ground as hard as you can. Place the garden hose next to the rod, and while running water into the hole, rock the rod back and forth about a foot or so, while applying downward pressure. A sledgehammer might be needed for the last couple of feet.

Brian Urban is a lab manager at the Department of Engineering Technology at the University of North Texas. Brian's trick is similar to that described above, and is courtesy of the power company.

Brian watched while the power company workers stabbed the rod into the ground, filling the hole with a small amount of water before repeating the stabbing action. When installed in soil with a low clay content, a standard drinking cup full of water was enough to drive an 8-foot rod in only a couple of minutes.

The last foot or so must be hammered, but a lot of effort is saved letting the water do the work.

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.

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See Page 22

Talk Radio



Radio World

Resource for Business, Programming & Sales

August 1, 2001

Salt Institute Evangelizes Radio

At a Small College in Downtown Portland, Maine, the Craft of Making Radio Documentaries Inspires Students to Pursue This Resurgent Form

Carl Lindemann

For all the opportunities for DJs, announcers and news reporters to learn their craft, the radio documentary largely has been a self-taught undertaking.

of Salt's work. When we began, we weren't sure what response we'd get from students," he said.

So far, the response has been strong. Now, after the second semester, it will become a permanent part of the course

University of Maine's community radio station, and seven years at University of Nevada's KUNV(FM) in Las Vegas.

The turn toward teaching seemed natural given his experience working with volunteers and professionals in these non-commercial settings.

Part of the start-up task is to create a basic audio production studio. The initial setup consists mostly of consumer gear tweaked for audio production. Core audio processing is done with an iMac computer running Digidesign Pro Tools.

Extra storage comes through a VST Firewire hard drive coupled with a CD-R recorder. Playback is through Tannoy SBM monitors driven by a consumer amp. Sony TC-D5M and Marantz cassette decks are used for field recording.

Power jellybeans

Surprisingly, the iMac's built-in audio connectors do a credible job in importing analog material, according to Rosenthal. Soon, a full Pro Tools setup on a Mac G4 equipped with a professional soundcard will be added.

Rosenthal's classroom is more of a seminar or workshop. The twice-weekly, two-plus hour sessions are hands-on and intimate. The day Radio World visited, the five students enrolled considered their current project: a profile of someone involved in transportation.

Subjects ranged from a taxi driver on a small island off the coast to a meter maid walking the streets of the city. With interviews already recorded, students considered how best to construct their pieces into compelling radio.

As these are completed, the idea is to cull the portraits together into a half-

See SALT, page 24 ▶

Radio Ads Get Multi-Media Push

Ken R.

Successful sales campaigns often begin with a client who has a problem that a radio station or group identifies. The answers can take the form of non-traditional revenue promotions, sponsored expos, or the Internet, or radio spots that tie into something happening at the client's business.

Radio World talked to executives at



Patty Wight is a Salt student who said her life was taken over by her radio course work there.

Since last fall, The Salt Institute for Documentary Studies in Portland, Maine, has brought the school's experience in capturing Maine-related subjects on film and print to the audio medium. This is a major addition to the school's core curriculum honed over 25 years.

Enthusiastic response

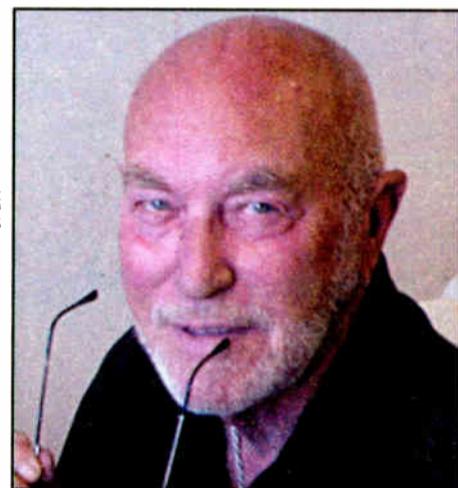
Rob Rosenthal, the radio program's director, started the pilot program.

"This seemed like a natural extension

offerings this fall. Perhaps more important, what was almost an aside for several students has become a career choice.

Numerous student projects have aired on the local National Public Radio affiliate and one alum has landed an internship with David Isay, the MacArthur Grant-winning independent producer for public radio.

Rosenthal came to Salt after an extensive career in public and community radio. Previously, he spent five years as general manager at WMPG(FM), the



Don Lea

several groups to ask about their sales success stories.

Frank Kulbertis is director of sales for the seven-station Adventure Radio Group in Hilton Head, S.C.

One successful campaign his group won was with Swifty Serve, a convenience store/gas station that opened a store in neighboring Ridgeland.

"Their location is away from the city

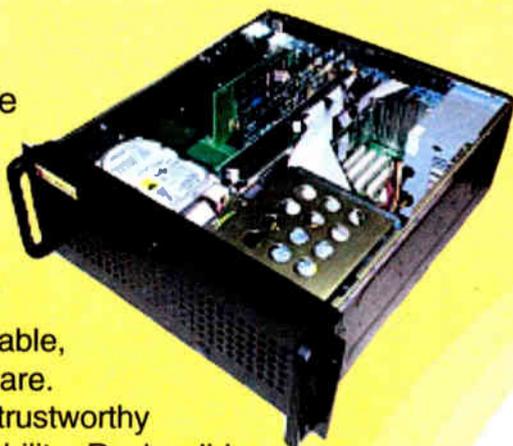
See CAMPAIGN, page 21 ▶

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World Radio History

Campaign

► Continued from page 20
and our goal was to get the construction workers and other citizens of that area to sample the store. So we ran (an ad campaign) two weeks back-to-back using our mainstream rock and our alternative stations, which target males," said Kulbertis.

Soft Rock 97.1
WASH-FM
More Music...Less Talk
Take **METROBUS** or **METRO** RAIL to...
97&1
fun things to do

in partnership with
NEWSEUM
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M opens doors
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WASH(FM), at 97.1 MHz, puts together the '97&1 Fun Things to Do' guide for Washington-area listeners.

Kulbertis believes that whether a client is on the air 52 weeks a year or in shorter bursts, vertical schedules have the most impact.

A vertical schedule, said Kulbertis, is one in which the spots are grouped in the fewest possible days to generate maximum frequency within a short period of time.

"Week one consisted of 25 spots on the rocker, five per day, and a live broadcast on Friday afternoon. The following week we followed a similar plan on the alternative station."

Kulbertis said the client helped by offering low-priced gas, prize registrations and other perks to make it an exciting event.

Charles Ratleff, store manager at the new Swiftly Serve, was overwhelmed by the response

"We got between 1,200 and 1,300 people out here in a two-hour period, taking in about \$18,000 for the day, which is spectacular for us," said Ratleff.

"Adventure is the best group we've worked with and I'd certainly be willing to go back on the air with them again."

Don Lea, president of the ad agency Don Lea Associates in Toledo, Ohio, is soft-spoken and almost self-effacing. Several of his clients have been with his agency for more than 30 years each.

One reason is that Lea uses radio a

bit differently.

"In the old days we used to run the TV spots where the owners smashed car windshields, threw the pies and all that stuff," said Lea. "One of the owners said to me, 'We're selling cars, but I'm not very proud to be a car dealer. How can we change things?'"

Lea took to radio for an image campaign, but he refused to mention prices and specific cars. He avoided fast-talking announcers and wrote the copy to avoid "fine-print" disclaimers. The spots are delivered by Lea himself in his slow, folksy drawl.

"When people hear other dealers' radio spots with a special price for a certain car, the customer goes into the dealership and finds out she has to be a left-handed monk or something to get

See CAMPAIGN, page 26 ►



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MANAGEMENT CORNER

Boomers Will Break Set Formats

Maturing Baby-Boom Demographics Pose New Format Directions; Talk Radio Could Be Huge Winner

Vincent M. Ditingo

Follow the boomers! That could very well be the new, or should we say revised, battle cry as many owners adjust programming strategies and formats against the backdrop of a soft economy and shrinking ad dollars.

After all, it's the baby boomer generation, generally described as those people born shortly after World War II, from 1946 and continuing through 1964, which has traditionally been radio's most lucrative, broad-based consumer group.

All the way

They have dictated lifestyle shifts such as automotive choices for years. Now, for the first time, the older end of the baby boomer segment is turning 55.

In fact, baby boomers are entrenched in what many analysts believe see as a new prime, advertiser-coveted demographic in the next five to 10 years: 35 to 64.

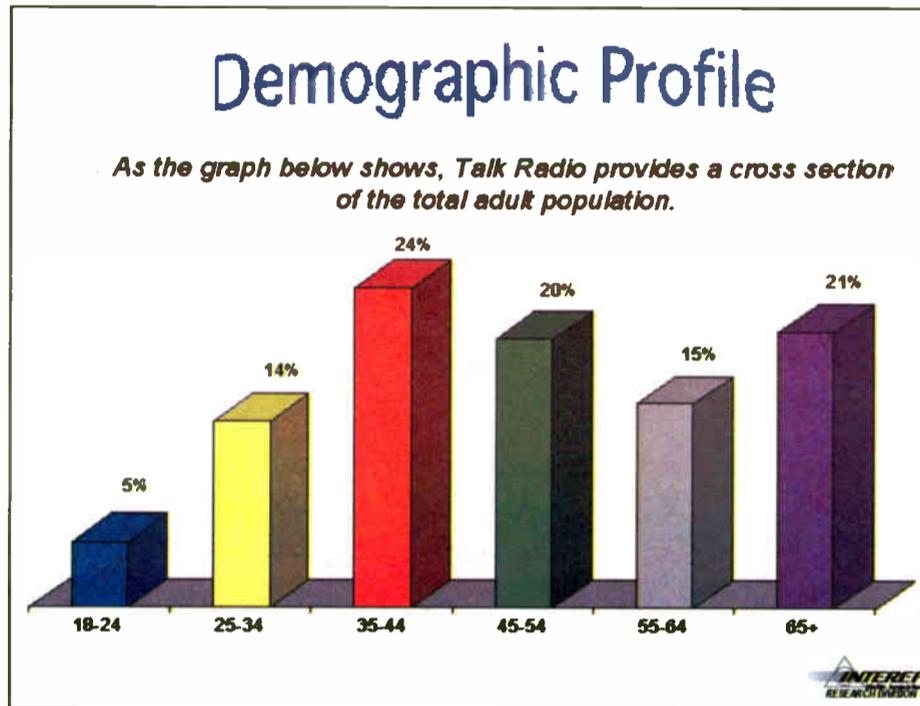
Many boomers may become attracted to non-music formats, especially

approach, as some industry critics maintain.

Indeed, talk radio, particularly topical two-way telephone talk, is positioned to become even more formidable in the next decade. In a new report on the dynamics of the format com-



talk radio, if they perceive that local music stations continue to program their content with a homogeneous



Corner reveal news/talk is the leading format category based upon Arbitron audience shares among persons 12 and older.

News/talk, which in this analysis excludes sports talk formats, registered a 12.2 percent audience share followed by urban contemporary with 11.4 percent, Spanish at 8.5 percent, adult contemporary at 7.6 percent and country at 7.5 percent.

The long-standing primary advantage to the telephone talk format is that it functions as a sounding board for listeners, especially for international and national events that affect local communities and lifestyles.

Ongoing

For instance, the hot topics in talk radio in 2000 that continued this year include Wall Street's downturn, rising fuel prices, potential electricity shortages, the dot-com implosion, reality

TV, piled by Interep, 44 percent of adults 18 and older who listen to talk fall within the 35-to-54 age bracket; 36 percent are 55-plus, while only 14 percent land in the 25-to-34 demographic group. (See accompanying chart.)

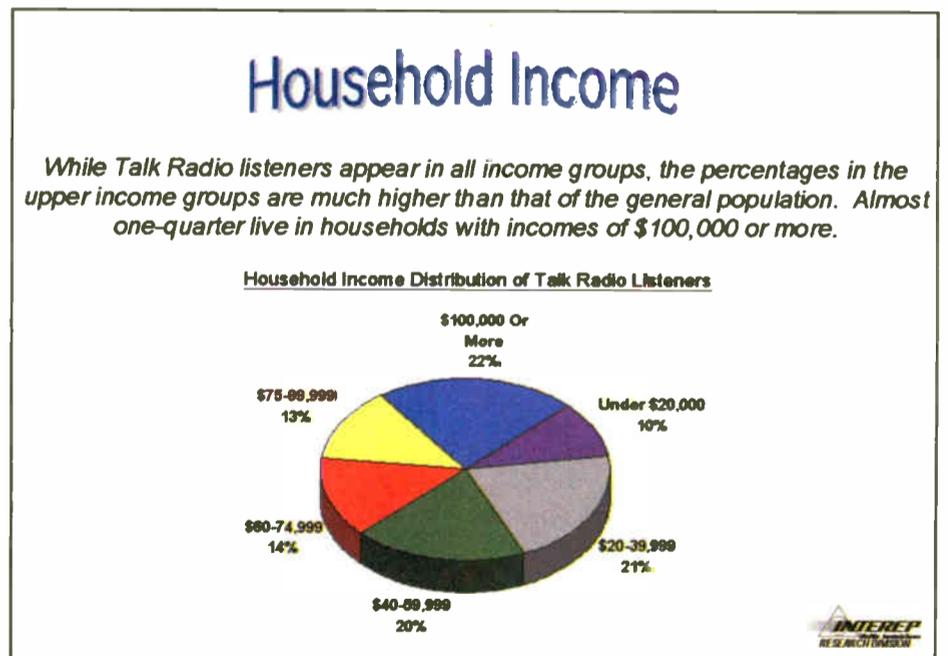
Driven by maturing boomers, a big demographic growth area moving forward is expected to be the 50-to-59 age group.

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The key barometer here is total resident population projections by the U.S. Census Bureau. Those projections show that from July 2001 through July 2005, the 50-to-59 age group will grow almost 15 percent as compared to the 15-to-24 age group, which is anticipated to grow by less than 5 percent in the same time period.

Remember that talk radio is part of the overall news/talk format category, which also includes those stations that describe themselves as news/talk and all-news. With that in mind, Interep calculations done for *Management*

television programs, Internet copyright issues, high school shootings and violence in the Middle East. There is never a lack of compelling topics to discuss.

Meanwhile, talk radio has also emerged as a forum to influence congressional legislation and to effect political change. Host Rush Limbaugh, for example, is renown for exhorting his listeners to fire up the phone lines in Washington to push legislation. Those listeners have had a definitive effect in political policy in the past decade.

See FORMATS, page 30 ►



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World Radio History

Salt

► Continued from page 20
hour montage. This project followed an initial vox populi — an opinion montage assembled to stand alone, without a reporter's narrative — piece that covered the basics of interviewing, sound gathering, radio writing and digital audio production.

Throughout, a good deal of time is devoted to listening critically to professional productions. The curriculum itself is still a work in progress.

Rosenthal plans to add a lengthier (20- to 30-minute) documentary as well as some interaction with other parts of Salt's programs.

radio students and their counterparts," he said.

The first alums have taken steps to develop careers in radio. Patty Wight has spent several months interning at Maine Public Radio. Before attending Salt, she'd been an avid public radio listener.

She often wondered how to get into the business. Aside from volunteering for fundraising, there was little opportunity to get in the door. Her studies at Salt changed that.

Focused

"It was very intense. It actually took over my life for a time! I went from knowing absolutely nothing to having a solid understanding of mics, interviewing and production," she said.

Armed with a demo from her class



Rob Rosenthal With Students



Rob Rosenthal is shown with some of his 'tweaked' consumer gear, used to train students in the Salt Radio Documentary program.

"Traditionally, writers and photographers have collaborated on a project during the semester. We are just now starting to talk about a collaboration between

work, she was able to approach the NPR affiliate's news director and arrange an internship. Now, she helps gather sound from around the state for the nightly

news show as well as produce her own pieces for broadcast.

In the Pacific Northwest, David Welch is finishing an undergraduate degree at Reed College after his semester at Salt.

compelling listening.

"We learned to edit, then edit again. We played with music under our voices, under our actualities, learning how it can work and often how it doesn't. Then,

The Salt Institute's radio curriculum is likely to open the door to other offerings.

Welch had some experience in college radio at Reed as a DJ, but what he learned in Maine was different.

"Salt's concern with carefully documenting the landscape and people of Maine is unique and refreshing," Welch said.

when it was over, we walked away with four to seven minutes of pretty good radio. Or, at the very least, something we were proud of," said Welch.

The Salt Institute's radio curriculum is likely to open the door to other offerings.

"There is some discussion of multime-



The Salt Institute in Portland, Maine

Also, he found that the school instilled a serious work ethic.

"Salt finds a way to compel students to work harder than they've ever worked before and somehow absolutely adore working that hard."

His studies combined this attitude with the necessary skills such as how to tell a story, to interview, record, log and assemble stories in such a way as to make for

dia work here. Combining text, images and sound for Web and CD-ROM makes sense," said Rosenthal. "Such developments may come in time, but they will be built on top of a solid foundation where radio is a key element."

Carl Lindemann lives in Maine, where he consults on radio/new media projects and writes extensively on these subjects. Reach him at carl@cyberscene.com.

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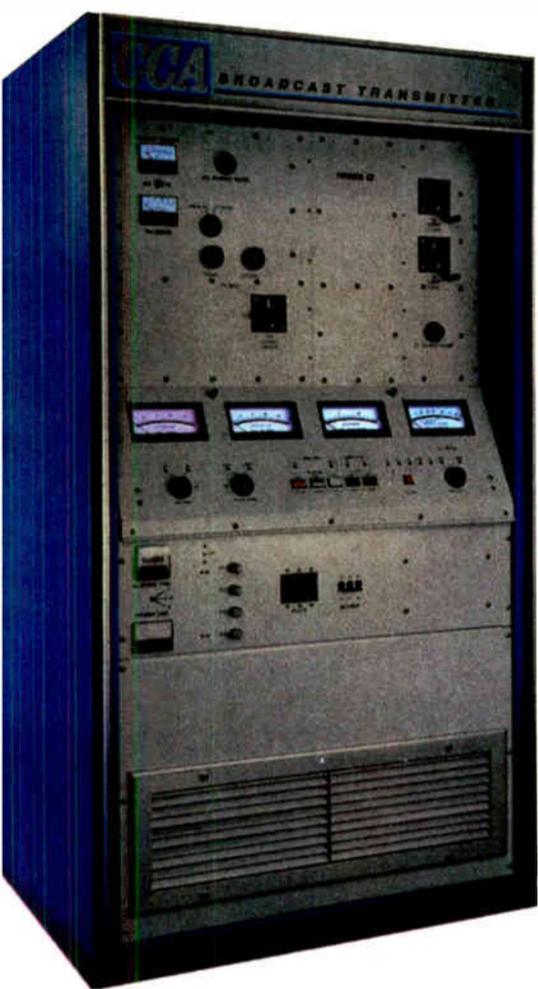
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ANTENNAS, TOWERS, TRANSMISSION LINE, INPUT EQUIPMENT,

MONITOR AND CONTROL, LTU/ATU, GENERATORS AND BUILDINGS

SEE OUR "NO HAGGLE" World Radio History PRICE LIST AT WWW.CCA.WS

Campaign

► Continued from page 21

that price. Already the customer is mad at the dealer," said Lea.

"We just tell the truth. Most people think that big dealers get a better deal from the manufacturers on their cars, but it isn't true, for example."

Brondes is number one in every local study of brand awareness. The dealership, as a sign of its success, just opened a second Ford outlet at the opposite end of the city.

Ingredients for success

Dave Gifford, president of a radio sales consultant company that bears his name, said a successful radio campaign must consider five criteria: the advertiser's

He avoided fast-talking announcers and wrote the copy to avoid 'fine-print' disclaimers.

Brondes Ford, the dealer in question, doubled its business within two years of moving to radio. According to Lea,

er's credibility, the message and/or offer made in the spots, the creative execution of that message, whether the



Brondes Ford doubled its business within two years of moving to radio.

target audience wants the product being offered and how many ads run.

"I hear people in radio tell me that they 'did everything right' but the advertiser got no results," said Gifford. "Wrong. One or more of those compo-

ponents was not in place."

The Radio Advertising Bureau, which supplied several contacts for this article, is a good source of ideas on how to construct a winning sales campaign. Visit RAB online at www.rab.com.

Inside Ideas for a Hot Radio Campaign

Radio World talked to so many sales and station managers in preparation for the article above that we had more ideas than we could fit into the story.

Groups and stations have hit upon some great ideas that have worked for both the broadcasters and their advertisers.

Here are a few of the best we came across:

Kid Fest — The brainstorm of former AMFM (now Clear Channel) Sales Manager Lisa Eaker in Beaumont, Texas, who saw the need to connect with the family-oriented people of her market. Now in its fourth year, the two-day "Kid Fest" is a knockout event for the Clear Channel cluster in Beaumont.



KYKR(FM) afternoon personality Jim 'King of the Road' King is shown at the August 2000 Clear Channel Kid Fest in Beaumont, Texas.

"We've got advertisers calling us wanting to participate so it's an easy sale," said Jodie LeBrescu, event coordinator. "Our attendance is about 12,000 listeners, which is great for our market."

Kid Fest is divided into several physical zones including "learn and play," "cares for kids," "health and safety" and "play land."

Advertisers can participate at varying levels including "title sponsorship," for \$10,000. Only one client is allowed this privilege and it entails being named in all the advertising during the eight-week pre-event promotional push.

This sponsor's name appears on posters, TV spots and billboards and the client receives free booth space at the event. The "title sponsor" also receives a remote broadcast and other goodies.

Other sponsorship levels exist, from \$5,000 to \$3,500 and less.

"At all sponsorship levels, we have no competing clients," said LeBrescu.

Indiana Black Expo — Another live event has taken place for almost 30 years in Indianapolis: the Indiana Black Expo. In cooperation with urban oldies WTLC(AM-FM), the festival comprises Family Fun Fest, Summer Celebration and Circle City Classic.

The station, a Radio One property, begins to promote the annual summer event in May. By the time it concludes in late July, the station generates more

than \$100,000 in revenue, about 70 percent of which is non-spot income.

Community Affairs Director Kelli Lester-Brown stated that the station promotes the event on its own talk shows, broadcast remotes and also sells sponsorships.



Fraternity brothers (and friend) from Lamar University lend Clear Channel's KIOC(FM) a hand at the Kid Fest 2000 boxing booth.

According to IBE President Reverend Charles Williams, the yearly event has grown from a small volunteer operation to a multi-purpose, community-based year-round organization with national and international appeal.

Vertical schedules — An Adventure Radio Group client, Lowcountry Motors in Bluffton, S.C., took a "spots only" approach. The used car dealership has enjoyed great success over a long time, according to Frank Kulbertis, director of sales for the seven-station Adventure Radio Group in Hilton Head, S.C.

"They're on every month using a vertical schedule on all seven stations, 32 commercials per station per month. Usually we run four stations one week, three stations the next week, spreading the spots over a four-day period," said Kulbertis.

"Lowcountry spends less than the cost of one used car per month, about \$1,750. The spots run between 5 a.m. and midnight."

In Washington Patricia Wexler is director of marketing at Clear Channel's WASH(FM) at 97.1 MHz. She put together an unusual campaign called "97&1 Fun Things to Do." It's a brochure paid for largely by Metro, the public transportation system in Washington.

"It's got tips on free activities, Metro-accessible events and places our listeners recommend to us where they can take their children," said Wexler. "The brochures are free at the Metro stations and at the Newseum, a museum for news, that is another sponsor."

— Ken R.

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AUDIO TECHNICA ATW1128 - Handheld VHF wireless system with two independent RF sections for diversity reception, 20 frequencies.

Mfr. List \$549.00 SALE \$317.00

AUDIO TECHNICA ATWU102 - Affordable UHF systems consisting of a diversity receiver and plug-in transmitter with 100 selectable PLL synthesized channels.

Mfr. List \$1,099.00 SALE \$742.00



FREE
AT804
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ATWU102

SHURE UC24158 - Frequency agile UHF handheld system with 30 mW transmitter. Choose from 99 selectable frequencies. Shure SM58 mic capsule.

Mfr. List \$1,417.00 SALE \$999.00

SENNHEISER EW345 - Economical dual channel handheld UHF system with 8 frequency presets, 30 mW RF power and battery level indicator.

Mfr. List \$1,300.00 SALE \$779.00



DT290

REMOTE
MIXSPORT

GX500

Headsets

BEYER DT290 - Lightweight design with high-quality dynamic mic element.

Mfr. List \$339.00 SALE \$239.00

BEYER DT190 - Full featured with hypercardioid mic element and studio quality headphones. Both Beyer headsets include cable and connectors.

Mfr. List \$439.00 SALE \$319.00

SENNHEISER HMD25XQ - Acoustically damped and sealed earcups for isolation. Supercardioid, noise-cancelling dynamic mic, cable and connectors.

Mfr. List \$479.00 SALE \$379.00

SHURE SM2 - Popular, economical headset with proven reliability.

Mfr. List \$389.00 SALE \$199.00

Portable Mixers

GENTNER MICROTTEL1 - Portable, telephone interface. SALE \$259.00

JK AUDIO REMOTEMIX C+ - Combination mixer/headphone amp/hybrid.

Mfr. List \$599.00 SALE \$529.00

JK AUDIO REMOTEMIXSPORT - More advanced than Remotemix C+, with 3 XLR inputs (one switchable to line level), 2 headphone jacks, VU meter, etc.

Mfr. List \$999.00 SALE \$879.00

MARTI GX500 - Feature laden unit, with 4 mic inputs, 2 aux inputs, for use with regular phone or cellulas.

Mfr. List \$1,299.00 CALL FOR PRICE

NORTECH MAX-Z - Remote broadcast console with 4 XLR inputs and 4 headphone jacks, phone line out, telephone keypad, VU meter.

Mfr. List \$1,299.00 SALE \$1,126.00

RADIX TLM500 - Battery powered mini-console turns any phone line into a remote studio with one mic input and one headphone input.

Mfr. List \$279.00 SALE \$259.00

ROLLS MX54S - Mixes 3 mics into 1 XLR output.

Mfr. List \$150.00 SALE \$108.00

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FREE
Get two extra
Microphones
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Complete Fender PA System

Passport is a totally self-contained 250 watt portable sound system complete with a 4-channel mixer, 2 full-range speaker units, 2 dynamic cardioid microphones and cables. This package also includes a pair of heavy-duty speaker tripods. And right now, we are including two additional microphones, absolutely FREE with your purchase! Many accessories also available including wireless mics, battery pack and more.

FENDER P250PKG COMPLETE PA SYSTEM Mfr. List \$1,119.98 SALE \$784.00

FENDER P250 WIRELESS MIC SYSTEM Mfr. List \$279.00 SALE \$196.00

FENDER 12VDC-DC POWER ADAPTOR Mfr. List \$149.99 SALE \$105.00

FENDER BATTERY PACK Mfr. List \$200.00 SALE \$140.00

FENDER TRAVEL PACK Mfr. List \$120.00 SALE \$84.00

Favorite Handheld Mics

AUDIO TECHNICA AT804 - An excellent interview mic.

Mfr. List \$110.00 SALE \$77.00

BEYER M58 - Handheld dynamic, internal shock mount, 40 Hz to 20 kHz.

Mfr. List \$279.00 SALE \$224.00

ELECTRO-VOICE 635A - Rugged dynamic interview mic, with voice-tailored response.

Mfr. List \$172.00 SALE \$99.00

SENNHEISER MD46 - Designed for audio journalists, with low handling and wind noise.

Mfr. List \$199.95 SALE \$169.95

SHURE SM58PKG - The industry standard stage mic. Distinctive vocal presence peak and integral windscreen.

FREE 25' mic cable with purchase

Mfr. List \$212.00 SALE \$99.00

SHURE VP64APKG - Omnidirectional interview

mic sounds great and is very rugged.

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Mfr. List \$143.00 SALE \$79.00

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Portable Recorder SALE

MARANTZ PMD222 - 3-head mono portable cassette recorder with XLR input.

Mfr. List \$519.00 **SALE \$396.00**

MARANTZ CLC221 - Protective case for PMD222.
SALE \$33.33

MARANTZ RB430 - Ni-Cad rechargeable battery for PMD222. **SALE \$67.00**

ACE KEB20 - Nylon carry bag for PMD222. **SALE \$21.00**

HHB MDP500 - Rugged portable minidisc using ATRAC compression, with editing functions on-board.

Mfr. List \$1,545.00 **SALE \$1,495.00**

SONY MZR700DPCBLUE - Tiny portable minidisc recorder with up to 53 hours playback on an AA battery.

Mfr. List \$299.95 **SALE \$239.00**

SONY MZB50 - Lightweight portable minidisc recorder with voice operated recording.

Mfr. List \$599.95 **SALE \$449.00**

TASCAM DAP1 - State of the art DAT recorder with high-quality D/A and A/D converters for a true professional sound, with mic limiter.

Mfr. List \$2,199.00 **SALE \$1,649.00**



Call BSW for the Best Price on Codecs

COMREX MATRIX - 15 kHz POTS codec with full duplex audio on a single phone line. Two mic inputs, line level XLR output.

Mfr. List \$3,700.00 **CALL FOR PRICE**

COMREX ENVOY - Delivers 15 kHz at 128 kbps or 7.5 kHz at 64 kbps for full duplex ISDN broadcasts.

Mfr. List \$3,500.00 **CALL FOR PRICE**

COMREX VECTOR - The latest POTS codec in the Comrex line, the Vector delivers nearly 15 kHz audio at 24 kbps or higher.

Mfr. List \$4,500.00 **CALL FOR PRICE**

COMREX NEXUS - Capable of 15 kHz as well as 7.5 kHz low delay, two-way mono audio over ISDN or SW56.

Mfr. List \$2,300.00 **CALL FOR PRICE**

COMREX HOTLINE - Affordable digital transmission device capable of up to 10kHz two-way audio on a standard phone line.

Mfr. List \$2,800.00 **CALL FOR PRICE**

TELOS ZEPHYR XSTREAM 9402 - An ideal codec solution for ad hoc networks, voiceovers, commercial distribution, backup to microwave and satellite links.

Mfr. List \$3,990.00 **CALL FOR PRICE**

TELOS ZEPHYR XSTREAM MPX 9502 - The portable, road ready version of the new Telos Zephyr Xstream.

Mfr. List \$4,490.00 **CALL FOR PRICE**



RPU Equipment

MARTI SRPT40A - This 50 watt RPU

transmitter has four balanced microphone inputs.

Mfr. List \$2,795.00 **CALL FOR PRICE**

MARTI CR102D - Dual frequency receiver with built-in test meter and monitor speaker.

Mfr. List \$1,425.00 **CALL FOR PRICE**

MARTI SR10 - Frequency agile RPU receiver has front panel frequency selection with 6 programmable priority channels.

Mfr. List \$2,500.00 **CALL FOR PRICE**

MARTI YC450 - Yagi antenna offers 5 or 6 elements depending on frequency selected.

Mfr. List \$225.00 **CALL FOR PRICE**

WILLBURT HURRYUP - A simple, inexpensive antenna mast for remotes.

Mfr. List \$1,650.00 **CALL FOR PRICE**

34 or Web Site www.bswusa.com

World Radio History

Formats

► Continued from page 22

"Nothing moves product like a talk show host talking about it on the air," stated veteran radio programmer and consultant Walter Sabo in the new Interep report. "In talk, ads aren't background noise, they are part of the program."

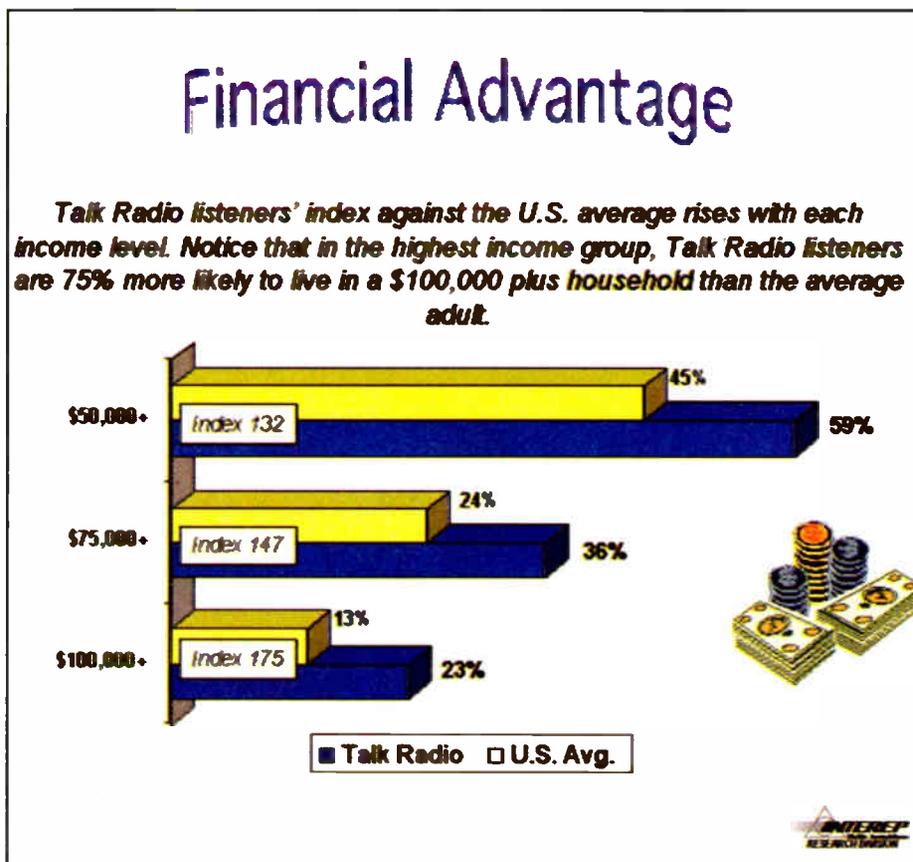
Although often confrontational, talk radio can stir listener emotions more effectively, providing a sense of community that can elevate a station's time spent listening in a way that music stations might envy.

Ladies listen

And the belief among some programmers that talk is a male-dominated format is not entirely true. According to Interep, of the talk-radio listener universe of adults 18-plus, 57 percent are men and 43 percent are women. Another key dynamic: Virtually all talk radio listeners are economically upscale.

From a pure advertising-sales perspective, talk radio has one of the better power ratios. According to the BIA Financial Network's "State of the Radio Industry 2000" report, the talk and all-news formats each have a power ratio of 1.17. (The power ratio measures the ability of stations within a certain format category to change ratings into revenues.)

That means that both talk and all-



news radio stations tend to oversell their audience ratings by 17 percent. They are both fourth behind sports talk, the power ratio winner in the talk category at 1.55; adult contemporary at 1.20; and album-oriented rock/classic rock at 1.19.

The talk and news/talk formats have become such an integral part of the American fabric that even the two new

satellite radio companies, XM and Sirius, each plan to offer 50 non-music formats, many to be some version of news/talk, with limited commercials when they launch this summer. (Both companies also plan to offer 50 non-commercial music formats.)

This discussion of a potentially burgeoning audience for news/talk, and in particular for talk radio, does not diminish the huge audience popularity and revenue success of adult contemporary and rock stations within the 18-to-34 age group — essentially the children of baby boomers.

Opportunity

Rather, this discussion points to the fact that as competition among local station clusters has increased with the economic downturn, owners will consider switching from poorly performing music formats to a format that will appeal to an aging boomer audience that has long been loyal.

Although such a switch could be a heady operational investment at a time when the cry for streamlining costs has infiltrated all stations in all markets, conventional wisdom has shown that in radio, the winners generally are those who are willing to stay ahead of an ever-changing programming curve and adapt to changes in the marketplace.

Here comes one of those changes: Baby boomers are approaching their peak earning years.

Vincent M. Ditingo is an assistant professor of communication arts and coordinator of the radio program at the New York Institute of Technology.

Contact him via e-mail at vditingo@aol.com.

There was a time when a Mac-based Phone Editor made good sense...
yeah, like 1995.
Radio has grown up since then. It's time your Phone Editor did too.



Presenting Qed, the Windows 2000 Phone Editor from ENCO Systems, the people who know the PC. Balanced I/O, included control surface with jog/shuttle wheel, one-screen interface, uses standard .WAV files, talks to most automation systems and is ready to go right out of the box. Think of it as kinda like that cute Mac product, but all grown up!



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◆ STATION SERVICES ◆

Programs and Services for Radio Stations

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Dolans, BUYandHOLD Strike Deal

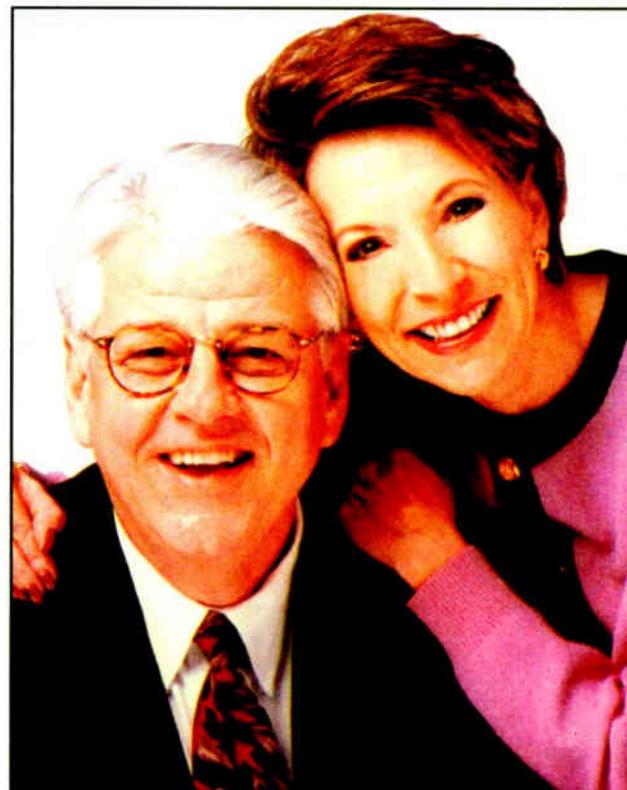
BUYandHold, an online brokerage firm, announced that Ken and Daria Dolan will serve as spokespeople for the company.

The Dolans, whose financial call-in radio program is broadcast daily in nearly 200 markets on the WOR Radio Network, have more than 35 years of experience over a broad range of personal finance subjects.

The Dolans are recipients of the only four-star rating for financial broadcasting excellence from Newsweek magazine. They are the authors of three books on personal finance and one on e-commerce. They hosted their own show on CNBC for four years, are former contributors to "CBS This Morning" and "CBS News Saturday" and have appeared on a variety of TV programs including "Wall Street Week," "Today" and "Live with Regis and Kathie Lee." In 1996 they were voted into the Radio Hall of Fame.

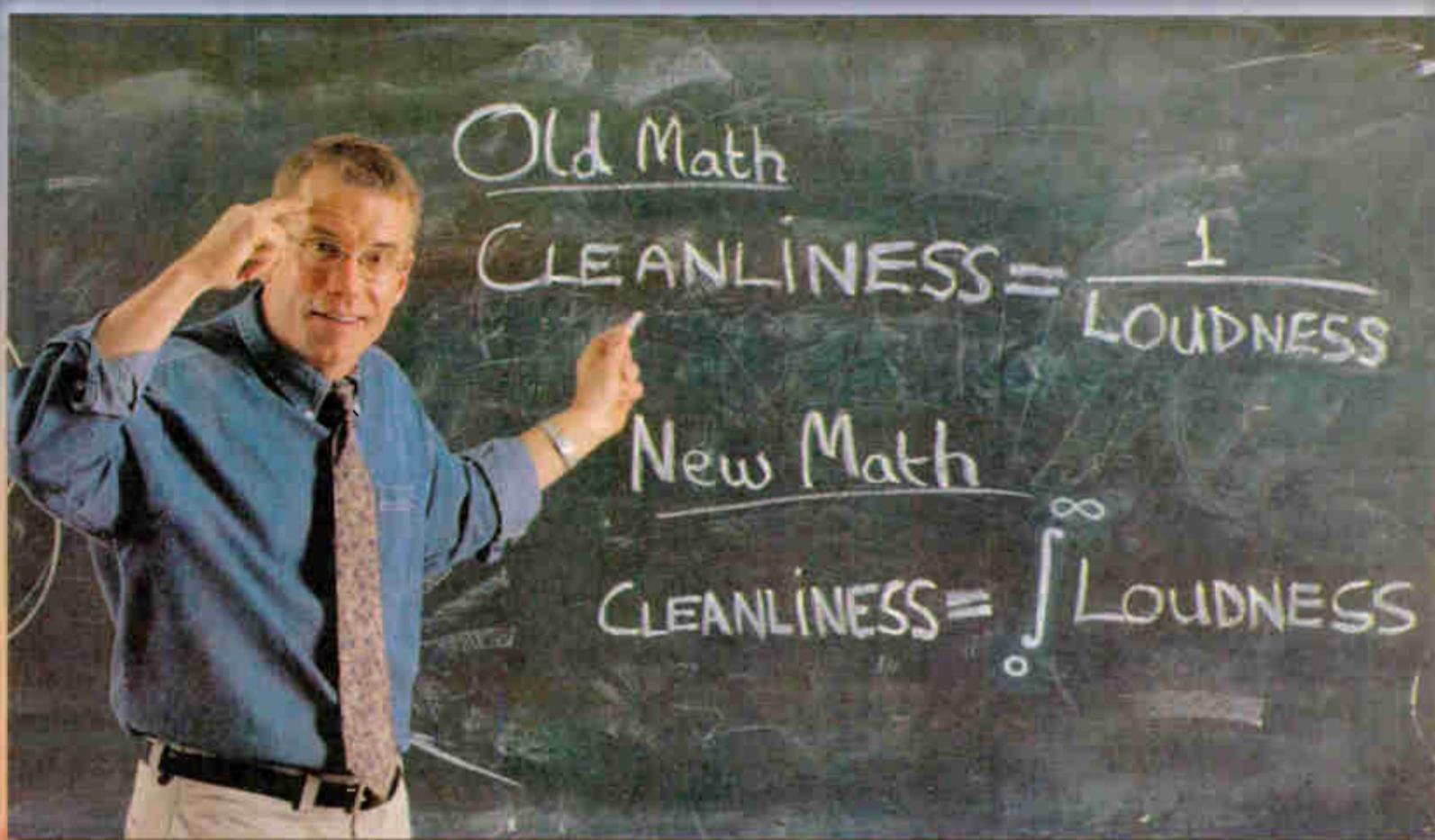
The Dolans will also provide financial commentary as columnists in the Family Finance section of the company's Web site. In addition, they will appear as featured speakers at BUYandHOLD-sponsored events and seminars.

For more information contact Trylon Communications for BUYandHOLD in New York at (212) 725-2295 or send e-mail to harrisonw@trylon-communications.com.



Ken and Daria Dolan

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.

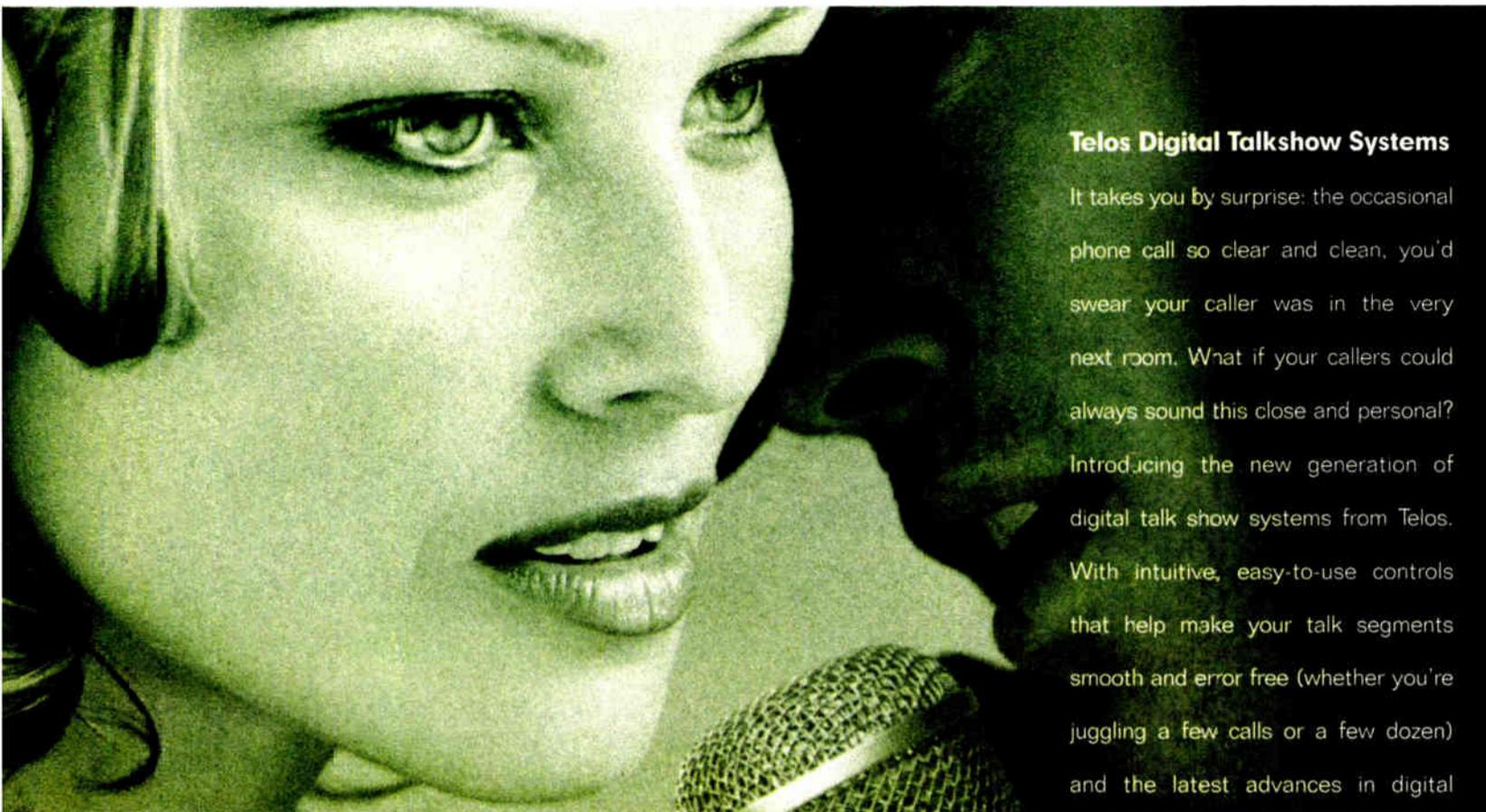
Audition the new 2020 MkII on your station and you'll find that Aphex has really done its homework—creating a processor with performance and features unmatched at any price. The 2020MkII—in a class by itself.

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Telos Digital Talkshow Systems

It takes you by surprise: the occasional phone call so clear and clean, you'd swear your caller was in the very next room. What if your callers could always sound this close and personal? Introducing the new generation of digital talk show systems from Telos. With intuitive, easy-to-use controls that help make your talk segments smooth and error free (whether you're juggling a few calls or a few dozen) and the latest advances in digital

phone hybrids from the company that invented them. Never have your callers sounded so consistently loud and crystal clear – it's the next best thing to having them there. Don't just talk to your audience... get intimate.

Telos Systems. Connected.

Talk radio is suddenly intimate



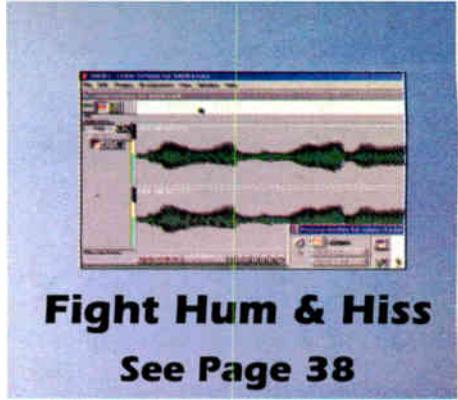
Telos TWOx12™ Integrated Talkshow System

Using POTS or ISDN lines, the TWOx12 handles up to 12 callers on two built-in digital hybrids. The intuitive phone controller tames even the wildest talk shows.

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Studio Sessions



Radio World

Resource for Radio On-Air, Production and Recording

August 1, 2001

PRODUCT EVALUATION

HHB: Big Sound in Tight Spaces

Carl Lindemann

Suddenly, "active" or powered monitors are everywhere. A key advantage for active designs is greater audio accuracy.

In principle, bi-amping each speaker individually improves sound reproduction. But there is an added advantage for cramped studios. Amp integration keeps things to a more manageable size and saves the need to make room for one externally.

The HHB Circle 3A active nearfield monitors are an excellent choice when space is at a premium. Given the 4.5-inch woofer/mid driver, low-range bass reproduction is limited. Fortunately, this becomes a non-issue when you are monitoring voiceovers and other typical radio material.

Signed, sealed, delivered

The Circle 3As are a sealed box design with the drivers and electronics mounted in a one-piece, acoustically dead composite case. The 10.6- x 6.9- x 8.7-inch form factor of the cabinet is typical of mini-monitors.

The models are a bi-amp design that dedicates 60 W to the LF driver and 30



HHB Circle 3As are in use at 'Living on Earth' studios.

tweeter is a ferro-fluid cooled soft-dome design. Both LF and HF have

On the front, an LED indicator under the tweeter shows if power is on. It also signals if the tweeter's emergency breaker has been triggered to protect it from overload. All controls are on the back including a master volume control and a switch to choose between an unbalanced RCA plug or balanced XLR input.

The only other connectors or controls are the power plug and on/off switch. Everything is magnetically shielded to work well in the proximity of computer monitors.

The only issue with the layout of the controls is that reaching around for

See HHB, page 40 ▶

For voiceover and radio work, there is really no pressing need for heavy-duty bass lower than 100 Hz.

W to the HF driver. The bass/mid range driver is a paper pulp cone; the

Sallen and Key active filters. The crossover point is at 3.5 kHz.

LINE OUT

Optimize Your PC for Digital Audio

Increase Your Computer's Overall Audio Processing Speed With a Few Simple Changes

Bruce Bartlett

Many readers are using computer workstations to edit radio programs or create spots. If the editing involves just two tracks, computer speed is not too important.

SCSI drives tend to be faster than IDE, but SCSI costs more, and many IDE drives are fast enough.

But as productions become increasingly elaborate — more bits, more tracks and more effects — speed becomes critical.

The data flow of multitrack digital

See LINE OUT, page 36 ▶

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ONE SYSTEM...ANY INPUT...ANYWHERE

Routers with Attitude

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World Radio History

In the Spotlight!

The Broadcast Richardson name may be new to you, but its ideology is not...servicing the customer.

With the acquisition of turnkey distributor Broadcast Richmond in the Spring of 2000, Richardson Electronics realized the combined strengths of each organization would result in a very dynamic product and service offering.

The Broadcast Richardson name signifies an expanded direction for the company. By combining the technical, integration and consulting expertise of Broadcast

Richmond with the wide product offering, unsurpassed service levels and logistic strengths of Richardson Electronics, Broadcast Richardson is prepared to lead the way in the broadcast industry.

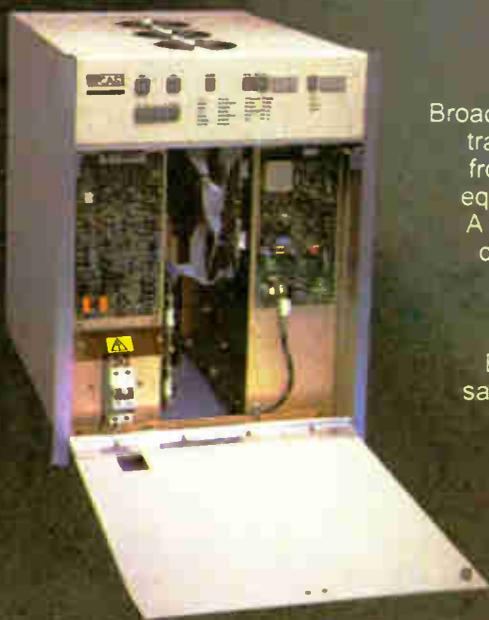
Complimenting its specialized, value-added services, Broadcast Richardson draws from its over 200 franchised product lines to offer you true inter-product integration.

Turn to us for your next component, equipment or system need!

A Featured Presentation...

From one of our 200 product lines!

AT1K5
AM Transmitters



RFCAST

MT1K
FM Transmitters



Broadcast Richardson offers a wide selection of AM and FM transmitter solutions. Responsive delivery is available from our factories. Exceeding FCC requirements, our equipment offers great reliability...at affordable prices! A full offering of power levels is available. For modular designs, RDS and stereo capabilities, ease of use, low operating costs and reliable operation - make sure to ask for RFCAST!

Broadcast Richardson understands that the initial sale of the equipment is only the beginning. We back our products with full warranty protection, immediate spare parts availability and strong technical support.

Call Today! 800-348-5580

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◆ PRODUCT GUIDE ◆

Products for Radio Air & Production Studios

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

Tascam Tapes at 24-Bit With DA-98HR

The Tascam DA-98HR is an STRS-format 24-bit multitrack modular digital tape recorder/player.

Designed for digital audio production, it provides record and playback compatibility with DA-98, DA-88 and DA-38 tapes using the 16-bit, 44.1 kHz or 48 kHz standard.

kHz switchable analog I/O boards. The digital I/O is implemented through two DB25 connectors available in TDIF and AES/EBU formats for interface into any recording environment.

The DA-98HR offers an LCD display, synchronization addressing RS-422, parallel control, MIDI



The unit includes eight tracks of 24-bit, 192 kHz audio, is compatible with the DA-78HR system and includes a confidence monitoring feature, allowing for monitoring from tape while recording.

It features digital ins and outs as standard with optional 44.1/48/88.2/96

in/thru/out and MIDI Machine Control and the capability of sample-accurate stacking of up to 16 DTRS units of any tape.

For more information contact Tascam in California at (323) 726-0303, fax (323) 727-7635 or visit the Web site at www.tascam.com.

ENCO Releases PC-Based Phone Editor

Qed from ENCO Systems Inc. is a PC-based phone-call editor for the broadcast market.

The Qed supports transfer of files to DADPRO32 libraries including compression and/or sample rate conversion.



The system is a Windows 2000-based, networkable, minitower workstation that features a Digigram professional DSP board, jog/shuttle control surface and the Qed software. The package without monitor sells for \$4,995.

Other automation systems can be supported. Additionally, the system is CartChunk-compliant.

For more information contact ENCO Systems Inc. in Michigan at (800) 362-6797, fax (248) 827-4441 or visit the Web site at www.enco.com.

Neumann Finds Digital Solution

The Solution-D is Neumann's foray into the digital microphone market.

The unit features a special synchronization method for remote control of typical microphone parameters and mixing console functions.

The system of the Solution-D digital microphone consists of three components: the Digital Microphone D-01, the Digital Microphone Interface DMI-2 and Remote Control Software RCS that permits operation and remote control of the microphone.

Signal and data transmission of the microphone conform to AES 42-2001. This standard identifies the transmission of output signals, power supply for the microphones and remote control of typical microphone functions and parameters.

For more information contact Neumann in Connecticut at (860) 434-5220, fax (860) 434-3148 or visit the company Web site at www.neumann.com.



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Line Out

► Continued from page 33

audio places high demands on computer speed, especially on hard drives. Playback and recording of digital audio require long, continuous periods of streaming audio data.

The more tracks in use, and the greater the bit depth and sample rate, the faster the data flow has to be. The more effects plug-ins that are used, the greater the load on the CPU.

Clearly, you need a fast computer for high-end audio editing. But you also need to optimize its settings for best results.

Let's consider some ways to speed up the data flow and to reduce the CPU usage. If you follow these tips, you will have a faster system that handles more plug-ins and more tracks at once. And clicks or audio glitches will be less likely in CD burns or in file playback.

Speed the hard drive

The hard drive should have a fast average access time — under 9 milliseconds — and a high internal sustained transfer rate.

What transfer rate is needed? In general, the data rate of digital audio is the number of tracks times the sample rate times bytes (8 bits = 1 byte).

If the result is in kilobytes (kB), divide it by 1.024. If the result is in Megabytes (MB), divide it by 1.04.

So the data rate of eight tracks of 44.1 kHz/16-bit audio (2 bytes) is 689 kilobytes per second; for 48/24 it is 1.1 Megabytes per second; and for 96/24 the rate is 2.2 MBps.

A full-blown production of 96/24 and 24 tracks can reach 6.6 MB per second.

Real-time DSP processing for effects may increase the rate by three to five times. So the actual transfer rate needed ranges from about 3.5 MBps for eight tracks of 44.1/16 audio, to 33 MBps for 24 tracks of 96/24.

The best current hard drives can transfer about 66 MB with a PCI bus and an Ultra ATA/100 interface — for EIDE drives — or a SCSI interface for SCSI drives. Do not use an ISA bus interface — it tops out at 2 MBps.

Hard drives with high rotational speed or spindle rate (7,200 rpm or greater) tend to have faster transfer rate — a rate of 10,000 rpm is recommended for 24-bit multitrack productions. SCSI drives tend to be faster

than IDE, but SCSI costs more and many IDE drives are fast enough.

Use one hard drive for audio files only and another hard drive for programs. Or use one disk partition for audio files and another partition for programs. If possible, use the lower-letter partition for audio files because it is the faster part of the disk.

Defrag frequently

You should defragment the audio file drive often or reformat it when you are finished with all the files on it.

After I tweaked the settings on my own computer system, the hard drive's sustained transfer rate became three times faster!

This process reorganizes files into contiguous areas on the disk so that each audio file can be accessed with minimum head movements.

Format the audio-file disk or partition using the command `FORMAT [drive letter]: /z:32 or /z:64` (the largest possible for your disk).

That "/z" switch creates bigger cluster sizes, which reduces the number of read/write operations and file fragmentation.

If your drive is SCSI, use drivers that allow bus mastering. Install bus-mastering drivers for your hard drives and enable Direct Memory Access (DMA) for IDE drives. Both these options can greatly speed data transfer and reduce CPU usage.

To check for bus mastering in Windows, go to Control Panel > System > Device Manager > Hard Disk Controllers and look for Bus Master Controller.

To enable DMA, go to Control Panel > System > Device Manager > Disk Drives. Double-click your hard drive, go to Settings and check the DMA box. You will need to reboot if you changed the DMA setting.

If you have both a master and a slave IDE drive, record on the master drive — it's faster.

After this is completed go to Control Panel > System > Performance > File System > Hard Disk. Some computer systems work better with Read-ahead optimization set to minimum, other to maximum. Switch the setting from Typical Role to Network Server because it gives higher priority to disk use.

In Performance > File system > Troubleshooting, hit Disable Write-behind Caching for All Drives.

You can also speed the data transfer of CD-ROM drives and CD burners. Go to Control Panel > System > Device Manager and double-click CD-ROM.

Select your model of CD-ROM. Under Settings, check Disconnect, Sync Data Transfer and DMA. Do not check Auto-Insert Notification. Doing so will cause the computer to interrupt every few moments and check the CD-ROM drive for a disk, which steals CPU cycles away from the project at hand.

Complete this configuration then go

to Control Panel > System > Performance > File system > CD-ROM and set Supplemental Cache Size to maximum.

Install lots of memory — 64 MB is minimum, 128 MB is better and 256 MB is better still. The idea is to have your programs running in RAM, rather than swapping data to your hard drive. Get the fastest CPU you can afford.

Consider using a non-accelerated video card, because faster cards place high demands on system timing. Do not multitask (run other programs) while the audio is streaming. Each additional task slows down the system.

The following tips apply only to Windows on a PC:

Shut down background applications such as screensavers, System Agent, virus checkers and Windows sounds. These apps can interrupt data flow. In BIOS and in Windows, turn off power management. Otherwise the system might shut down at the wrong time. In the taskbar, shut down unused programs to save memory.

On the Web, download the latest drivers for your video card and hard disk adapter.

Set colors to 16-bit because 24-bit video wastes CPU cycles. Go to Control panel > Display > Settings.

Set the cache

Go to Start > Run > and type `Sysedit` to open `system.ini` in a text editor. Then find `[vcache]`.

Under `[vcache]`, make sure `MinFileCache` and `MaxFileCache` are both set to 4096, if your computer has 32 MB of RAM, or 8192, if your computer has 64 MB or more of RAM. Then save `system.ini` and reboot.

These settings do not affect audio performance, but keep the file cache from taking up too much memory.

Sometimes, setting Hardware acceleration to less than maximum can speed up audio throughput. After the reboot, go to Control Panel > System > Performance > Graphics > Advanced.

Then go to Performance > Virtual Memory and select "Let me specify my own virtual memory settings." Make these settings:

Hard disk: Usually C. Choose a disk other than the one you use for digital audio.

Minimum: Set to 2.0 - 2.5 times the size of your RAM.

Maximum: Same value as minimum.

Leave "Disable virtual memory" unchecked.

Click "OK" and restart Windows.

The more effects plug-ins you use, the fewer tracks you can mix, because effects put a big load on the CPU.

You might be able to get around this problem by installing a DSP card, such as the TC Work Powercore. It handles the processing for the plug-ins. The plug-ins can access the card rather than the CPU. You can install multiple cards to expand the system.

If you have a program that measures disk throughput, you might want to measure your system's speed before and after each change mentioned above. That way you will know which changes were effective.

After I tweaked the settings on my own computer system, the hard drive's sustained transfer rate became three times faster! I hope your changes will be as effective. 🌐

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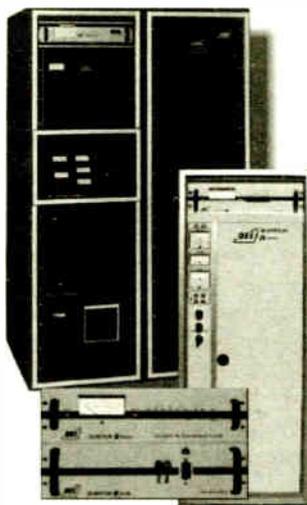
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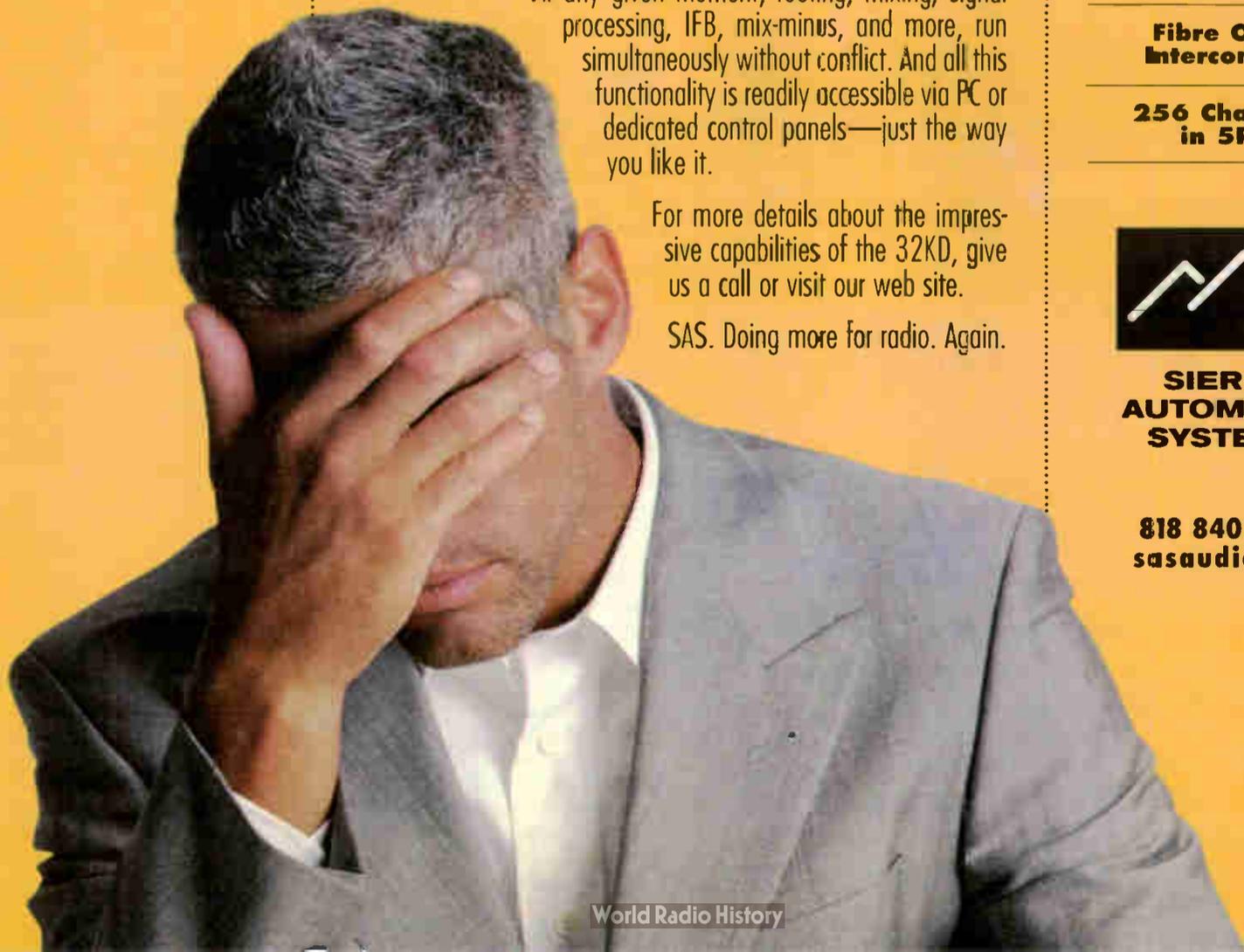
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PRODUCT EVALUATION

Pump the Volume, Not the Noise

The Cedar DeNoise Eliminates Pesky Background Hum and Hiss With a Simple Fingerprint

Ken R.

Sometimes noises are good — for example, if you are trying to isolate a component that is failing intermittently. Each crackle and hum gets you closer to your goal.

Usually, however, noises are bad, like those on old tapes that almost drown out the program material.

Audio can be affected by all manner of colorful background hums, crackles, pops, and the all-time analog favorite, hiss. Fluorescent light hum, air conditioner drone and even crowd hubbub mar audio you hear even on national newscasts.

A number of software and hardware products designed to deal with these irritants exist. But, my friends, now there is renewed hope of ridding your audio of these unwanted guests forever.

Fingerprinting solves crimes

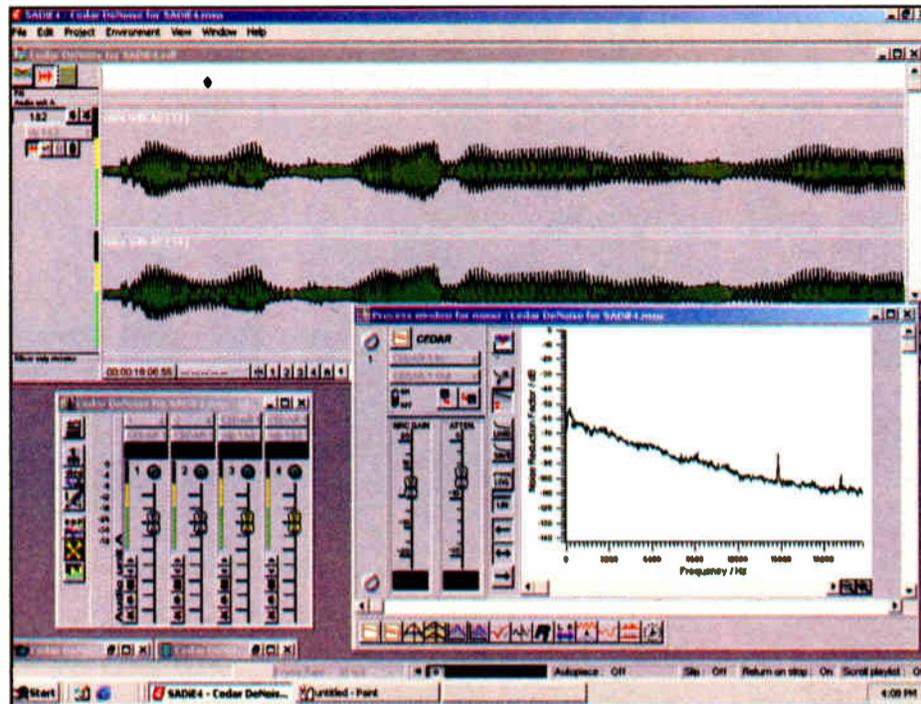
British company Cedar Audio makes a variety of sound restoration tools that are pricey but effective. The sound tool I deal with is the Cedar DeNoise, available only through Sadie and priced at \$2,500.

The product is helpful in eliminat-

ing or greatly reducing constant background noise. Other more esoteric

blems will have to wait for a separate article.

Hardware products such as those made by dbx and others allow the user simply to set a threshold and then gradually or suddenly gate all audio



Cedar DeNoise for Sadie4

flaws in sound such as dropouts, tape squeal, phase shift and azimuth prob-

lems below that level. Cedar works on a different principle.

The user samples the noise source prior to or between the desired audio segments by holding down the mouse clicker for about a second. Cedar makes a digital fingerprint of the background noise.

From that point, it is an easy matter to slide down the "attenuate" fader onscreen until you achieve the result you seek.

Note, DeNoise only works with steady-state noise or constant noise; it will not remove background TV audio from a voice tape, for example.

My typical application is removing hiss and occasionally hum from audiotapes recorded in the 1960s and '70s. Sometimes the hiss is barely noticeable; sometimes it makes a second- or third-generation dub almost unlistenable.

Jingle squiggle

The process begins by loading our program material through the analog ports of the Sadie system. The software lets you look at the audio onscreen in colorful solid blocks, or, with the click of a mouse, as waveforms, which show the main audio and the spaces between clearly.

In our case, we are restoring PAMS ID jingles recorded in the halcyon days of Top 40 for AM stations such as WLS, WABC, WFIL and others. When viewed onscreen as waveforms, a jingle package of 20 cuts is seen as red squiggles representing the music, with four-second gaps between them representing the alleged silence between the cuts.

For purposes of this article, we are using jingles from Radio Luxembourg. These have a moderate level of hiss and hum, mostly apparent between the jingles but clearly present through soft passages in the music itself.

Once the jingles are recorded onto Sadie, I access the Cedar module by clicking on the processing icon, selecting Cedar DeNoise and bringing it into the path of the virtual mixer. Now the fun begins.

As I listen, I can hear the noise I wish to eliminate. Playing through the selection, I briefly hold down the "sample noise" icon between cuts. A small box immediately pops up with a digital picture of the offending hiss and hum, featuring dB as the vertical aspect of the scale and frequency in Hz as the horizontal.

Hum and hiss

This particular noise has a hum component centered around 60 Hz and a hiss component centered around 3.2 kHz. No matter, Cedar is about to improve both greatly in one pass.

Again playing through the audio, this time manually lowering the attenuation fader as I go, I hear the junk disappear as if by magic.

Let me pause here to say that Digidesign Pro Tools offers a module designed to work in a similar manner, but in my experience it twists and muffles the desired audio with as little as a few dB of noise reduction.

The software causes artifacts and a loss of high-end content. It also eats reverb trails, twisting them into something unpleasant. Not so with Cedar.

Like a surgical laser cutting away unhealthy cells while leaving the healthy ones, Cedar DeNoise zeros in on and gets rid of at least 10 dB of noise, and in some cases as much as 20 dB without affecting the jingles in the slightest.

This is enough to save all but the most hopeless audio. From this point it is a simple matter to "bounce" the entire audio chunk through Cedar with the level of noise reduction I want, replacing the original flawed version of the jingles in the edit decision list onscreen.

I own one tape of some people horsing around in the PAMS studios, and everyone is at least 10 feet from the microphone. This dub is second-generation and recorded on quarter-track machines in 1972, but it is historically interesting and I wanted to see if I could salvage it by removing the almost unbearable hiss.

After sampling a portion of the noise alone, I began attenuating. At about 10 dB a great deal of the noise went away and the voices still sounded very natural.

At about 18 dB down, most of the noise was gone, but the voices took on a rather Martian distortion. It was much easier to hear every word clearly, but it was like looking at an image in a fun house mirror.

After following a suggestion by a Sadie tech, I bounced the audio with about 10 dB of attenuation, then resampled a slightly different section of noise and did a second pass with Cedar taking out about another 5 dB of noise with good results.

Several years ago I did some consulting work for the Toledo police, filtering out noise from audio surveillance tapes. I didn't have Cedar then, but I did the best I could using parametric EQ with moderate results.

The key there was just to be able to understand what was being said. The

See CEDAR, page 39 ►

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Cedar

► Continued from page 38

DeNoise module is much more accurate and would be perfect for that sort of use, even if it distorted things a bit.

From the source

I was so amazed with the product that I contacted Gordon Reid, managing director of Cedar Audio, who explained that its success comes down to the quality of the signal processing algorithms.

"It's relatively easy to remove unwanted sounds from a signal," he said. "What's much more difficult is to detect these in the presence of a desired signal, isolate them and remove or reduce them without introducing unwanted artifacts."

"You can remove all of the unwanted noise by just turning down the amplifier to zero, but that also removes the signal. So it's not how much noise you remove that matters; it's the compromise between noise reduction and the unwanted side effects."

The software lets you improve on nature by manually redrawing the

which is used at Skywalker Ranch, Fox, Universal Studios and Disney. Other Cedar audio restoration modules products available as rack-mount modules. Ken R. is a former broadcaster and



Gordon Reid

The biggest advantage to Cedar is that it is gentle to music, leaving the highs alone and not twisting up the percussion.

include DeClick, DeThump and DeCrackle. In addition to software solutions, the company makes its jingle studio operator. He can be reached via e-mail at kenr5367@aol.com.

Product Capsule:
Cedar DeNoise

Thumbs Up

- ✓ Removes constant noise sources with surgical precision
- ✓ Little or no damage to underlying audio
- ✓ Processes mono or stereo source material
- ✓ Simple operation

Thumbs Down

- ✓ Expensive for a software product
- ✓ Produces odd artifacts if used to extreme
- ✓ Useful only for constant noise sources
- ✓ A certain degree of skill and taste are needed for best results

Suggested retail price is about \$2,500.
For more information contact Cedar Audio in Maine at (207) 828-0024, fax (207) 773-2422 or visit the Web site at www.cedaraudio.com.

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noise fingerprint if you so desire. It also lets you store and recall settings you come up with which might be reused. Within the Sadie system, you can zoom in and out on the fingerprint onscreen to see more detail.

Real time

Cedar DeNoise works in real time. The company believes it is vital for the engineer to hear the processing as it is performed.

In additional tests on different types of constant noise sources, the program did well. I found that sometimes, only 5 to 10 dB of noise reduction is sufficient to clean up a voice tape and make it easier to understand. Hiss and hum were reduced in all cases with little or no effect on the underlying audio.

The biggest advantage to Cedar is that it is gentle to music, leaving the highs alone and not twisting up the percussion. In fact, it is almost impossible to notice any effect on music in most cases.

Cedar recently introduced the DNS 1000, a tool for dialogue clean up,

HHB

► Continued from page 33

the power switch is a bit tiresome. The simple solution here was connecting the pair to a surge suppressor.

Also, the way the power connectors stick straight out the back panel makes it impractical to place the units flush against a wall. Perhaps the workaround here is finding a right-angle plug to replace the ones included.

Performance

These quibbles are not unique to the Circle 3s. In fact, they seem to be commonplace with most units on the market.

At my home studio, I tested the

Circle 3s while monitoring, mixing and mastering some voiceover work for local clients as well as radio features for PRI's program "Beyond Computers."

The overall sound was smooth and steady from the low mids on up. For voiceover and radio work, there is really no pressing need for heavy-duty bass lower than 100 Hz.

Though the voice work was done in mono, listening to well-produced CDs was terrific. The 3-D presence of the soundstage was impressive.

Tracks with thumping deep bass still managed to intimate the sound without turning it into an annoying muddy rumble. Throughout, ear fatigue was minimal — unlike some "surgically accurate" monitors I have used.

Also, these units managed to do a credible job when cranked up. No, they don't get nearly as loud as the Circle 5s, which are the next models up in the HHB line. But they managed to get to their limits without noticeable distortion. I did not crank these till the tweeter protection kicked in, but it was nice to know that it was there.

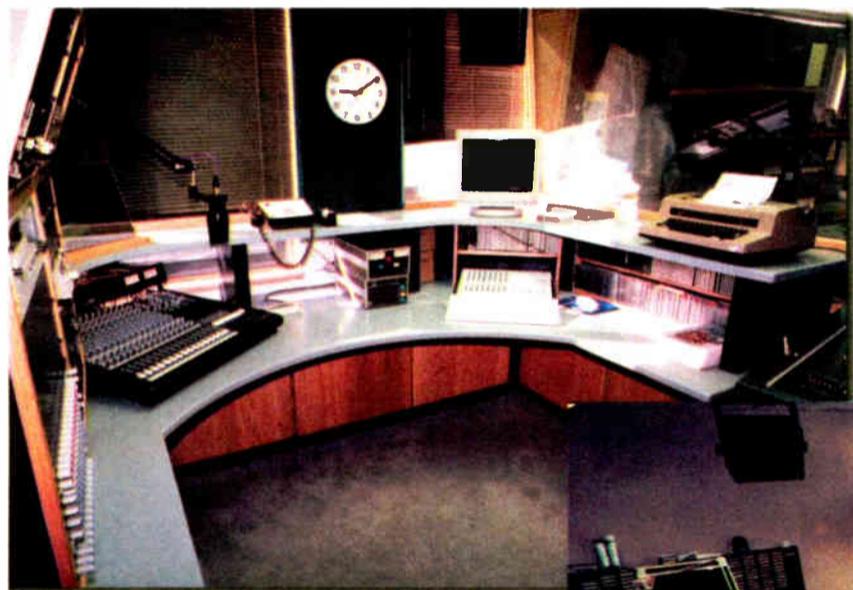
For a second opinion, these were pressed into service at NPR's "Living on Earth" studios in Cambridge, Mass.

The production cycle at LOE begins in a pair



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World Radio History

of closet-sized studios, each equipped with basic digital workstations. Here, audio gathered in the field gets loaded into the system. Producers check to be sure that what they heard through headphones made it to the recording while splicing it up into sound bites.

The dual setup assures everyone access. A single Circle 3 fit comfortably into each space. For LOE Technical Director Dennis Foley, the Circle 3s are a good match here.

"Our mini studios tend to be limited in their sound quality design and are very small; the HHBs are responsive enough for comfortable listening and not too boomy as to make the closed-in walls vibrate excessively," said Foley.

Plenty big

The HHB Circle 3As are plenty for handling most radio production projects where the focus is on midrange frequencies and not reproducing bass notes in pipe organs. The clean and pleasing mid-to-upper reproduction makes it especially suited for voice work.

The units are loud enough to do the job individually, but also are a stand-out for stereo listening. Given the size, the models are ideal for smaller installations.

The Circle 3As also do well on the road. At 11 pounds each, they are a snap for setting up shop on the road with a laptop equipped for audio production.

Product Capsule:

**HHB Circle 3A
Nearfield Monitors**



Thumbs Up

- ✓ Excellent for voiceover work
- ✓ High, undistorted sound levels in a small size
- ✓ Clean 3-D stereo imaging
- ✓ HHB purple décor



Thumbs Down

- ✓ On-off switch on back
- ✓ Power cord design makes it hard to position flush against walls

Suggested list price: \$795/pair

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

Buyer's Guide

Tech Updates



Inside

Radio World

Cabinetry, Cables & Switching

August 1, 2001

USER REPORT

Harris Fulfills Growth Needs

Entercom Boston Gets New Studios, Furniture & Wiring for the Digital Age

by John Kennedy
Director of Engineering
Entercom Boston

BOSTON A consolidation project is the ultimate wiring, equipment and furniture challenge. With the transition to digital, it can also mean starting from ground zero to create a facility that meets your stations' needs today and far into the future when the transition is completed.

So when our Boston radio stations — WAAF(FM), WEEI(AM), WRKO(AM) and WQSX(FM) — needed to replace aging equipment and reconfigure for their changing broadcast needs, it became clear to our parent company Entercom Communications Corp., itself one of the country's fastest-growing media companies, that it was time to consolidate the stations into one facility.



WRKO(AM) Talk Studio

That consolidation resulted in the creation of our 26,500-square-foot, \$4.5 million showcase broadcast center.

As director of engineering for Entercom Boston, I became involved in the planning and evaluation of broadcast equipment, so it seemed a logical progression for me to assume the role of project manager of the construction/relocation project.

One of the better decisions that I made as project manager was to put the system's engineering, facility pre-wiring, furniture design and construction and installation in the capable hands of Harris Broadcast.

After reviewing quite a few system integrators, we chose Harris because of the competitive pricing and the company's good work on another Entercom installation project in Buffalo, N.Y. We then tasked them with a fairly difficult deadline.

Build-out

Our general contractor was scheduled to complete the studio build-out in early January of 2001 and we had to move in at the end of February. The company had less than 60 days to move in all the studio furniture and equipment and complete the wiring and

delays in equipment and wiring, the company had the personnel and strategies in place to accomplish the wiring at our facility.

Even though our conversion to digital is still a few years off, our new facility wiring is digital-ready.



Entercom Engineering Room Rack Layout

While wiring, connecting and integrating the systems, the personnel discovered that connections in some terminal room wiring were faulty due to a problem with the tooling and manufacturing procedures from a third-party vendor.

Again, Harris saved the day by repairing or replacing those connections on-site to keep the project on time. The company's on-site installation crew was excellent and dedicated to the project.

The lion's share

The core of our broadcast center is our Harris-provided Pacific AMX, BMX-III and Airwave Digital consoles with the SAS 64000 routing switcher and an AudioVault audio delivery system by Broadcast Electronics.

Each of our studios is connected to this center with 24-pair Belden AES-3 digital cable and 25-pair CAT-5 cable. The CAT-5 cable was used for the logic wiring and for Ethernet signals. The inter-room wiring was also completed off-site.

Not every audio source in our facility is fully digital yet, but AES-3 also is an excellent analog cable providing a con-

stant electrical characteristic. The audio wiring was terminated on "Molex Blocks" while the logic wiring was terminated on Krone punch-blocks. Once the facility equipment was delivered, the cables were run to cable trays and the terminations for the studios were completed.

We run the gamut here from our "in-your-face" active rock DJs at WAAF(FM), to the sports talk of WEEI(AM).

for producing the baseball broadcasts and their feed to our uplink.

WRKO(AM) produces a syndicated program, "The Howie Carr Show," which is distributed through the ABC radio network. We must provide a feed with automation tones and a separate delay system to ABC. And the list goes on and on.

We decided to go with custom furniture for our two AM talk radio stations. We wanted to have the potential for two co-hosts and space for up to three guests in each of the studios.

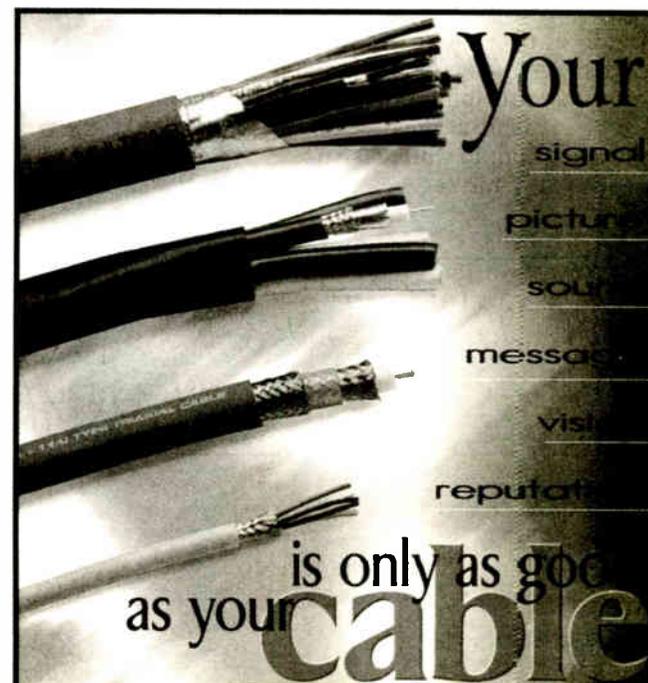
And we wanted to ensure that the co-hosts were positioned to see each other as well as viewing their guests. With the custom configuration we accomplished that while fitting everything else that we needed in our constricted space.

We were able to match the laminates and wood finishes of the Primeline modular furniture to the custom pieces to create a seamless design element for the facility's control room and remaining production studios at a considerably lower cost point. And the average person really can't tell the difference between these furniture units.

See HARRIS, page 44 ▶

Each has unique configuration needs for their shows.

WEEI(AM), the flagship station for the Boston Red Sox network, needs a studio



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USER REPORT

Mager Outfits Purdue Stations

by Michael Gay
Manager of Engineering Services
Purdue University

WEST LAFAYETTE, Ind. Public radio stations at major universities do not remodel often.

WBAA(AM) is the oldest radio station in the state of Indiana and represents Purdue University as the local National Public Radio affiliate. WBAA(FM) offers fine arts programming to Purdue and the surrounding community.

The studios on the Campus of Purdue University in West Lafayette, Ind., are laid out pretty much as they were built

in 1940. Finally the opportunity came to rebuild the facility and expand the space. We wanted everything to be of high quality because we did not know when this opportunity would present itself again.

We knew that the studio furniture we would choose was going to have to last, and we knew we wanted something that would complement our four new studios, designed by Russ Berger Design Group.

We looked at many options for studio furniture and submitted drawings of the space to several manufacturers for ideas. Mager Systems Inc. came up with an organic design made from solid surface that added interest to a space designed

with many straight lines. It provided many options, which allowed the furniture to be tailored to our needs.

Mager worked well with Russ Berger Design Group in choosing appropriate materials and colors for our space. On site, Mager and his staff were prompt, courteous and efficient. I still find it hard to believe that a truckload of pieces arrived Thursday and I had equipment loaded in the furniture by Sunday evening.

I just hope Mager is still building stu-



dio furniture in 60 years, when we decide to remodel again.

For information contact Mager Systems in Arizona at (623) 780-0045 or e-mail mager@magersystems.com.

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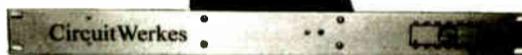
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DTMF-16c shown with optional rack mount



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The DTMF-16 is perfect for interfacing networks to your automation, controlling remote satellite receivers, repeaters, etc. Connect it to an audio source and its outputs will operate whenever there's a tone. With a list price of only \$199, the compact & rugged DTMF-16 can be put almost anywhere to provide the remote controls that you need. For more info, contact us or your favorite broadcast supplier.

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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.

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TECH UPDATES

Three Tiers For Wheatstone

Wheatstone has designed a series of studio furniture to accommodate a range of decor and budget requirements.

The series offers diversity through three design choices that incorporate the same rigid steel interior structural elements but differ in exterior finish details.

The Preference Series combines the wood with smooth, rounded-edge wood-trimmed cabinet panels that use horizontal grade high-pressure laminates. The countertops, available in standard or custom colors, have radiused handcrafted corners and rounded wood trim. This series is available with non-wood-trimmed solid-surface materials.



The Eclipse Series is designed for studios where use of space must be optimized. Like the Preference Series, this furniture features rack space in the wing counters, steel machine-tapped components, top and bottom ventilation, removable doors, dual-access punchblock enclosure and rack space included in the console counter pedestals.

The console counter's front steel U-beam provides support as well as a convenient location for built-in headphone jacks.

The Techline Series embodies the interior structural features and details of the other series, but features cost-effective countertops edged with a vinyl bullnose.

The furniture lines accept the Wiremax Studio interface system, which allows standard off-the-shelf cabling to interface to Wheatstone, Audioarts and Auditorics products via source machine native connectors.

For more information contact Wheatstone Corp. in North Carolina at (252) 638-7000, fax (252) 637-1285 or visit the company Web site at www.wheatstone.com.

Studio Tech Establishes Basis

Studio Technology now offers a line of standard-configuration furniture called Basis. The furniture is priced to be competitive with modular furniture, but is built to order, thereby retaining customization.



The line features three standard configurations starting at \$3,900 plus shipping. Each can be purchased without making any design changes; or the configurations can be used as the basis for studio furniture design and modified to suit individual needs and repriced accordingly.

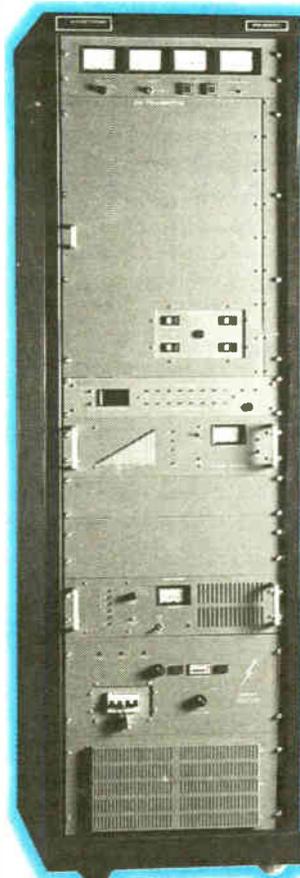
Standard configurations were designed to fit a range of console sizes and will work with the tabletop or cut-in consoles. In general, each configuration will fit in a studio of 11 by 11 feet.

Standard materials are used in the construction of the furniture, but can be modified according to specification.

The base cabinetry consists of assembled boxes. Two people can assemble a studio in an hour with a battery-powered screw gun and a 7/16-inch wrench.

For more information contact Studio Technology in Pennsylvania at (610) 640-1229 or visit the Web site at www.studiotechnology.com.

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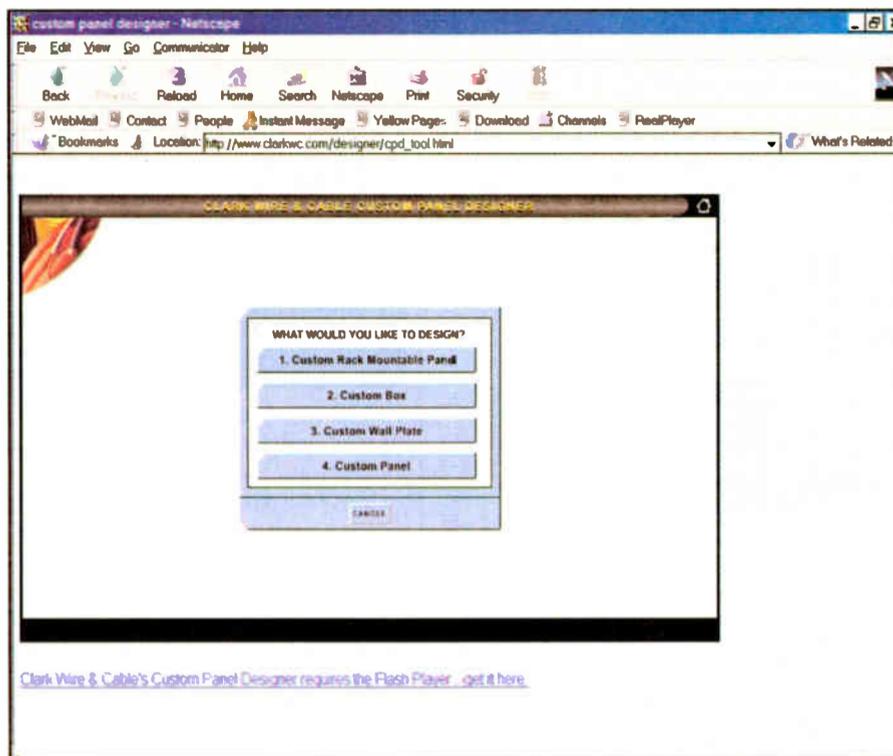
from the editors of
Radio World

TECH UPDATES

Design Virtual Wiring With Clark

Clark Wire & Cable has incorporated a custom panel-design program on the company Web site with the panels and connectors already drawn. The service is free.

The program works by prompting the user to select one of four options: custom rack-mountable panel, custom stage boxes, custom wall plates or a custom panel where the user can supply his or her own dimensions.



Once the type of panel is selected, the user can choose to add, remove and rotate connectors to the panel; add designators to be engraved and white-filled; and print a copy of the finished drawing or send it to Clark for a quotation.

The choice of connectors range from a simple XLR to a 45-degree Triax connector, as well as video, data and voice connectors. Each can also bear up to 20 characters of text.

With more than 50 connectors to choose from, this program gives users the versatility to design anything from a 1 RU panel to a custom 25- x 50-inch panel.

For more information contact Clark Wire & Cable visit the Web site at www.clarkwc.com.

SAS Digital Audio Router

Designed as a modular, distributed core audio routing system, the 32KD from Sierra Automated Systems can perform audio functions including routing, mixing, sound processing, IFB and mix-minus.

It uses distributed time division multiplexed bus architecture, which the company says enhances fault tolerance and minimizes the effect of any single-point failure.



Multiple processors in each frame distribute command functions and increase reliability. Modules and power supplies are designed to be hot-swapped.

The mainframe is 6 RU high and can house 21 module locations. Each frame supports 512 I/O channels plus network interfaces, control, processing and power. The backplane supports 1,024 local and remote channels. Fiber optics interfaces allow multiple mainframes to be networked, for unlimited channels. Dual counter rotating rings provide redundant paths.

Very large systems are cost-effective thanks to linear expansion. ATM data format allows long-distance transport.

Other features: breakout to various connectors; assignable processors; routable non-audio signals such as serial data and contacts; many points of access for control; Windows control software.

For information call (818) 840-6749 or visit www.sasaudio.com.

Harris

► Continued from page 41

With our 18 studios in constant use now, Harris Primeline and custom furniture have covered our bases with their flexibility, design and durability.

Ow! My back!

Moving day finally arrived. And even with an extensive studio punch-out list after the big day, the company's service has been outstanding.

My engineering staff is pleased because we now have a well-documented installation master plan that makes troubleshooting much quicker and easier. The wiring system installed by Harris makes additional wiring simple.

Our talent is pleased with the new studios and layout. They also discovered that the World Feed Panels — studio I/O panels with all popular connections that were installed in every studio — allow them quickly to patch in portable source equipment without much effort or worry about finding the proper cables.

Thanks to Harris, a large project became infinitely more manageable



Entercom Engineering Room With Molex Wiring

and the result was a facility that has something for everyone while focusing on our daily broadcast needs.

John Kennedy is a 24-year broadcast veteran and former vice chairman of the SBE chapter in Boston. He

is DOE for Entercom Boston, overseeing a staff of five engineers.

For more information contact Harris Broadcast in Ohio at (800) 622-0022, fax (513) 459-3890 or visit www.broadcast.harris.com.

TECH UPDATES

Gepco Improves DT12 Connector

The Gepco V37 Series of DT12 connectors features a low-profile, metal, universal termination design. The V37 replaces the company's VKC Series of connectors.

Exterior components of the connector are made of hard anodized machined aluminum with left-hand threaded back shell and back nut sections. This construction makes the design useful in mobile production and hostile environments.

When properly terminated, the metal-on-metal thread grip coupled with

the reverse-thread mechanism prevents accidental loosening of the backshell. Unlike setscrew type designs, a terminated V37 is both secure and weather-tight. In addition, wrench flats now are present for assembly and disassembly.

The V37 features a universal cable design that enables it to be terminated to either large or small diameter cables, with or without steel mesh cord grips or XLR fanouts. It has a resizable multipiece gland/strain relief that seals the interior of the connector from outside elements.

The metal backnut is multi-stepped internally to accept large and small metal cord grips. This design seats the cord grip after the strain-relief, allowing the seal to remain uncompromised.

In addition to functional improvements, the V37 Series has a thin profile and low weight. The new connectors weigh only about an ounce more than the original VKC thermoplastic connectors.

As with the original Gepco DT12 connectors, the new V37 has a crack-proof neoprene insulator, gold-plated solder contacts as a standard feature



and is mateable with existing DT12-type connectors.

For more information contact Gepco International Inc. in Illinois at (847) 795-9555, fax (847) 795-8770 or visit the Web site at www.gepco.com.

RF Connectors Go Sub-Miniature

The RSA-3000-I connector from RF Connectors is an addition to the company's sub-miniature line of SMA, SMB, MB, MCX and miniature pin plugs and receptacles.

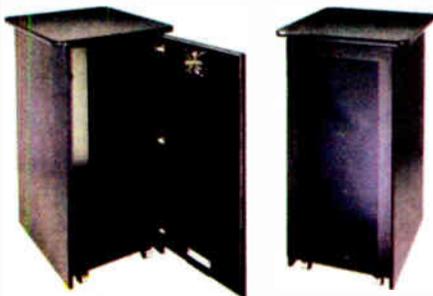
SMA connectors are used in high-frequency and microwave applications. This SMA straight crimp plug features Teflon insulation, a gold-plated contact and a nickel-plated body.

The unit is designed for simple assembly and crimp installation in use with Times Microwave LMR-400, Belden 7810A or Belden 9913 low-loss RG-8/U type cables. Other SMA connectors are available for RG-174/U, RG-142/U, RG-8X and low-loss cables from Belden, CommScope and Times Microwave.

For more information contact RF Industries in California at (858) 549-6340, fax (858) 549-6345 or visit the company Web site at www.rfindustries.com.

Isolation Rack Cuts Computer Noise

The S24DG isolation rack from Middle Atlantic Products is designed to house computers and hard-drive arrays and cut down on noise pollution that these technologies may produce.



The 24-space S24DG isolation rack is lined with absorptive material and includes a gasketed Plexiglas front door and a gasketed solid rear door for sound insulation. The rear door has a built-in quiet fan and filter with a brush grommet at the door bottom to allow sealed cable exit for noise and airflow control.

For more information contact Middle Atlantic Products Inc. at (973) 839-1011, fax (973) 839-1976 or visit www.middleatlantic.com.

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Crown designs, scheduled for release in the fall, build on this history with new features for new market requirements, as well as options that can fit current Crown transmitters for new applications.

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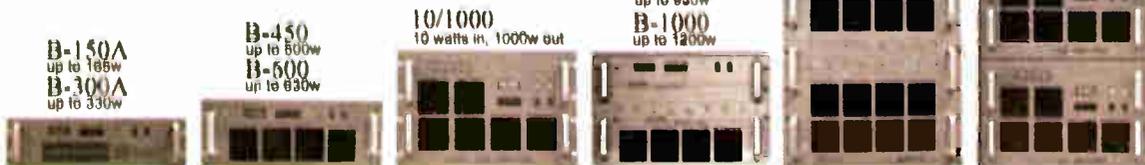
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TECH UPDATES

Airshow 2000 Makes Space for Talent

Spacewise Broadcast Furniture Inc. Blendedtone Airshow 2000 series is the company's latest addition.

The Airshow is a wood-built and laminate system that is priced to be competitive in its niche.

The product is available in three suggested configurations: guest show, with guests on one side of the operator; morning show, with talent opposite the operator; and the general studio configuration, a full-sized studio.



All feature finished solid woods for bullnosing, trim and kicks. Tops are 1-1/2-inch thick throughout and finished with laminates. Sidewalls are birch-finished plywood, with laminates on the exterior. Units come in large-scale modular components.

Options include upgraded woods like cherry or walnut.

For more information contact Spacewise Broadcast Furniture Inc. in Arizona at (480) 704-9385, fax 480-704-6149 or visit the Web site at www.spacewise.com.

SCMS Completes Successful Install

SCMS Inc. recently completed a turnkey project for a major group station in Charlotte, N.C.

The console used was a Wheatstone A-6000 and the furniture was custom-designed and manufactured by DID Corp.

SCMS Inc. prewired the console and provided on-site engineering to install the equipment and furniture. This was the most recent of many studio and RF integration projects completed over the past 25 years by SCMS Inc.

For more information contact SCMS Inc. in North Carolina at (800) 438-6040 or visit the Web site at www.scmsinc.com.

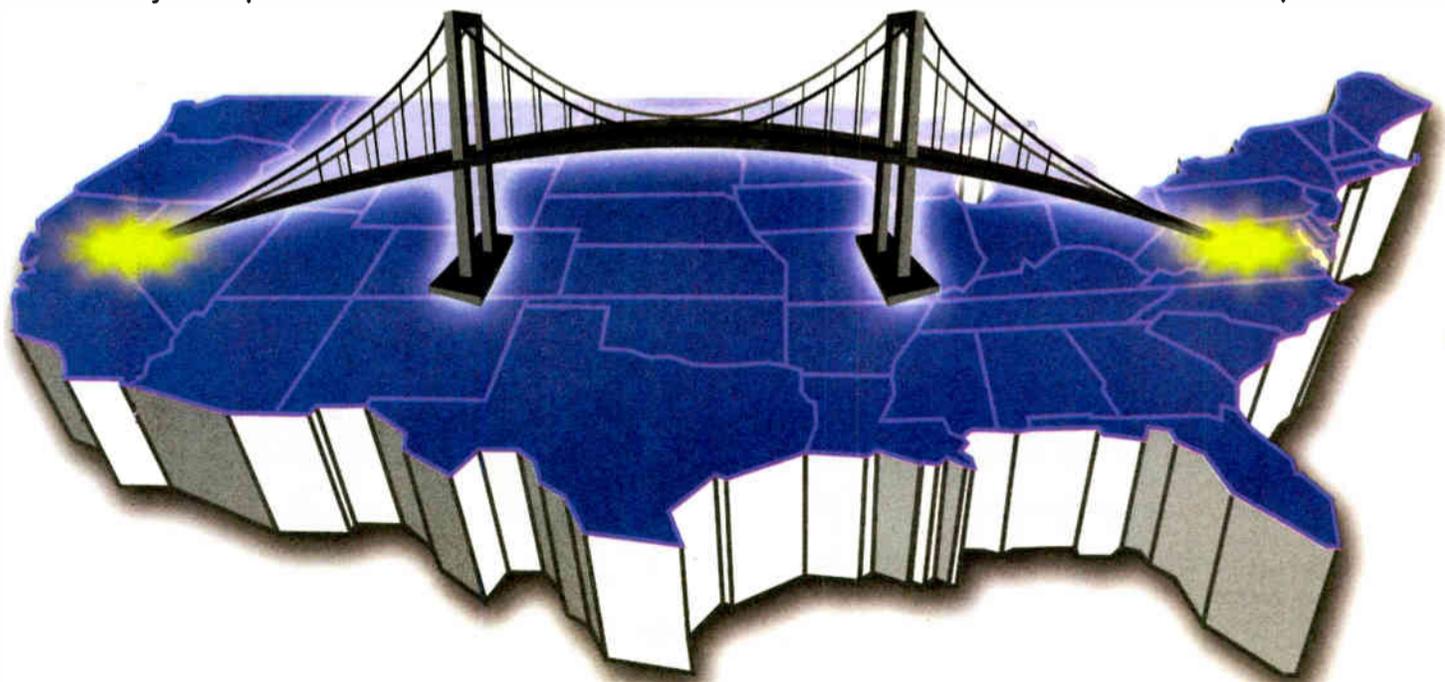


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TECH UPDATES

Wheatstone Builds Bridge for Wiring

The Bridge 2001 from Wheatstone is a digital audio network router that offers a solution for growing studios with mixed audio standards. It won a Radio World "Cool Stuff" Award at NAB2001.

The unit's 7-inch rack-mount digital routing cage features bidirectional fiber optic or CAT-5 interlocation connectivity, digital domain AES switching, and analog or digital inputs and A or D outputs. Each cage is capable of handling 512 simultaneous audio channels on its backplane.

The 2001 handles smaller applications, yet offers growth via stackable

units to upgrade to larger system configurations. The cages can be separated over great distances, with many studios connected to a central rack room.

This system provides shared resources and permits independent satellite studios, each with its own combination of analog and digital input and output cards and connector modules selected to suit a variety of gear.

Mixed signal switching is accomplished with a choice of AES digital or analog 24-bit A/D input cards or 24-bit D/A analog output cards, which can be serviced from the front of the cage.

A family of I/O connector modules plug into the rear of the cage to accommodate AES or analog interfaces or 75-ohm digital audio equipment. RJ-45 connectors are also available for use with CAT-5 wiring systems.

The connector modules facilitate the mix of signal technologies and standards within the same cage. One point-to-point interconnect can service up to 64 channels of simultaneous bi-directional digital audio, intercage communications, X-Y controller commands, plus auxiliary RS-232 data streams.

The Bridge 2001 features GUI setup software

with multi-tiered authorization and security levels. Control panels and PC applications are available, designed for operational ease and a rapid learning curve.

For more information contact Wheatstone Corp. in North Carolina at (252) 638-7000, fax (252) 637-1285 or visit www.wheatstone.com.



Klotz Makes Connections

Klotz Digital V_532E General Purpose Interface rackmount unit for the Vadis D.C. II console features 32 inputs and 32 outputs connected to the D.C. II through a CAT-5 Ethernet connection.

The unit can be used to remote control external equipment and allow external equipment to control the D.C. II console.

The system has 32 relay contact-closure outputs and 32 earth-free optocoupler inputs. Each trigger's characteristics can be changed for each input and output ranging from constant closure and pulse positive/negative to edge positive/negative definitions.

The company also has developed MADI optical input and output modules for the D.C. II console.

The V_260 input and V_261 output modules offer multichannel audio digital interface via a fiber optic connected card.

The units feature 64-channel fiber optic connection in standard MADI format. The V_260 and V_261 modules can interface with third-party MADI consoles, which then function as a control surface to the D.C. II.

For information contact Klotz Digital in Georgia at (678) 966-9900 or visit www.klotzdigital.com.

LPB Aims to Cut Out Boom Noise

The Silent Boom from LPB Communications is designed to cut back on unwanted noise that a boom movement creates. The unit features an extruded aluminum frame designed to eliminate echo, flocked springs to eliminate twang, Delrin machined base to cut back on transients and an external cable mounting groove.

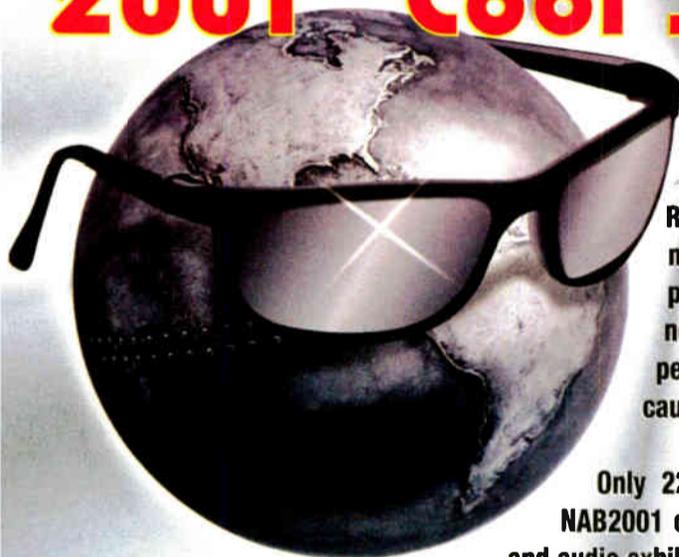
The base fits into existing standard mic mounts. Each Silent Boom is shipped with a Delrin insert that requires a 3/4-inch hole to be drilled into the tabletop. The unit has a suggested retail price of \$159.

For more information contact LPB Communications Inc. at (610) 644-1123, or visit www.lpbinc.com.

Radio World

Congratulates the

2001 "Cool Stuff" Award Winners



Receiving the "Cool Stuff" Award is a significant accomplishment. It means a product was selected by Radio World's panel of broadcast engineers and industry journalists as notable for its design, features, cost efficiency and performance in serving radio users. It also means the product caused our judges to stop in the aisles and say, "Oh, cool!"

Only 22 winners were chosen for "Cool Stuff" Awards at the NAB2001 convention in Las Vegas from among more than 250 radio and audio exhibitors and many hundreds of new products.

Hats off to the winners!

- Wheatstone . . . Bridge 2001 Digital Audio Network Router
- TransLanTech Sound . . . Ariane Stereo Audio Leveler
- Telos Systems . . . SmartSurface Studio Controller
- TC Works . . . Powercore DSP-Turbo
- Symetrix . . . AirTools Audio Routing System
- Roland . . . VS-2480 Digital Studio Workstation
- Orban . . . Optimod-PC "Processor on a Card"
- Orban . . . Opticodec Streaming Audio Codecs
- Omnia . . . Omnia-6fm Digital Audio Processor
- MediaTouch/OMT . . . iMediaAdCast Online Content Substitution
- Harris Corp. . . BMXdigital Modular Digital Audio Console
- Fast-Talk . . . PPE 1.0 & PSE 1.0 Phonetic Preprocessing and Phonetic Search Engines
- Dialight . . . 860 Series LED Obstruction Light
- Countryman . . . E6 Headset Microphone
- Broadcast Tools . . . Time Sync/Time Sync II
- Broadcast Electronics . . . FM-20S 20 kW Solid-State FM Transmitter

- Bext XL 1000 FM Transmitter/Exciter
- Belar DAM-1 Digital Audio Monitor
- AudioScience . . . ASI4344 and ASI4346 MP3 Audio Cards
- Audion Laboratories VoxPro PC Digital Audio Editing Software
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Manual for Collins 26U limiter. Tim Coffman, 858-571-5031.

Symetrix 528 voice speech processor, older analog unit is fine. G.P. Brefini, GPMJ Broadcast, 12 Bailey St, Foxboro MA 02035. 508-543-0158 or gpmjbcast@aol.com.

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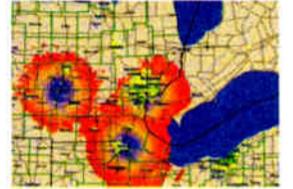
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Gates BC-500 used AM transmitter. 910 KC, 500 watts, single phase, call for details. BO. Kent Lankford, WAKO, POB 210, Highway 250 East, Lawrenceville IL 62439. 618-943-3354.

Harris 2.5 kW FM transmitter, 20 yrs old, no exciter. In great shape, \$2000/BO; Also old Gates 10 kW FM transmitter, no exciter, works, \$500/BO. Dennis Voy, KMAQ, 129 N Main St, Maquoketa IA 52060. 563-652-2426.

Harris Gates Five, 5 kW transmitter, solid state, 2 yrs old, perfect shape, \$20,000. Tom Hodgins, Alexandra Comm, 45 Campbell Rd, Walla Walla WA 99362. 509-527-1000 or 509-520-3000.

QEI 695T 3.5 kW FM transmitter, Peter Dahl power supply upgrade 5 kW single phase, \$5000. Tom Hodgins, Alexandra Comm, 45 Campbell Rd, Walla Walla WA 99362. 509-527-1000 or 509-520-3000.

Ramsey FM-100 hobby transmitter, plug and play 0-1watt stereo, \$375. Gene Whittenberger, POB 396, Mexico IN 46958. 765-985-2224.

Tepeco J-340 (2), used 2 yrs, like new, \$2000 ea. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

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Voice Of America has an opening for a qualified maintenance technician in its Washington, D.C. headquarters. Skills require experience in troubleshooting & repair of digital & analog radio broadcast equipment, & installation of on air systems & facilities. Competitive salary & excellent benefits. Contact Renee White @ 202-619-3752.

Radio World

Broadcast Equipment Exchange

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Distributor Directory	\$120	115	110	105
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Classified Line Ad	\$2/word			
Blind Box Ad	\$15 additional			

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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?
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Signature _____ Date _____

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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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PAGE	ADVERTISER	WEB SITE URL
3	360 Systems	www.360systems.com
42	Allied	www.ocwhite.com
31	Aphex Systems	www.aphex.com
43	Armstrong Transmitters	www.armstrongtx.com
46	ATI	www.atiguys.com
2	Audioarts Engineering/Wheatstone	www.wheatstone.com
39	Audion Labs	www.audionlabs.com
48	Audion Labs	www.voxpro.net
56	Auditronics/Wheatstone	www.wheatstone.com
46	Avcom-Ramsey Technologies	www.highpowerfm.com
24	BALSYS	www.balsys.com
43	Belar	www.belar.com
51	Bext	www.bext.com
48	Broadcast Data Consultants	www.broadcastdata.com
34	Broadcast Richardson	www.broadast-richardson.com
11	Broadcast Software Int'l (BSI)	www.bsiusa.com
42	Broadcast Tools	www.broadcasttools.com
28, 29	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
42	Circuit Werkes	www.circuitwerkes.com
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46	Summit Voicetracking Services	www.summitvoicetracking.com
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13	Telos Systems	www.zephyr.com
32	Telos Systems	www.telos-systems.com
55	Wheatstone	www.wheatstone.com

◆ READER'S FORUM ◆

Shortwave

I was disappointed in your June 20 editorial, "Time to Mourn Shortwave?"

Of course, you are quite correct that every broadcaster should consistently review the best transmission means available for his/her audience, but I think you could have emphasized more the importance of a correct conclusion from such an investigation.

Recent studies clearly conclude that the Internet is not yet a medium for a mass radio broadcasting market — even in the United States and certainly not in most of the rest of the world. Nor is local AM/FM a viable long-term solution in countries where political instability could cause the AM/FM plug to be pulled.

This is why shortwave is still very relevant for some international services. You were negligent in not making that clear.

Lawrence Magne gave a compelling argument on NPR's "Morning Edition" why the BBC has made a mistake in abandoning shortwave to North America and some other regions of the world.

Shortwave is still very relevant for some international services. You were negligent in not making that clear.

— George Woodard

In a nutshell, Larry's argument is that the BBC-WS is more than just two 15-minute newscasts a day. It is a 24-hour service of news, entertainment, features, sports and more of which some dedicated shortwave listeners, including some British expatriates, will now be deprived.

Maybe in the whole scope of things not a positive move for the BBC.

George Woodard, PE
Director of Engineering
Continental Electronics
Dallas

Both my wife and I have been contributors to RW. We greatly admire the quality of your work, which has produced an industry publication unlike any other.

Just as in the case of our Congress and the Bush administration, I believe you may be a victim of half-truths re short-wave broadcasting.

You cannot compare the BBC reduction

of HF broadcasting to that being mistakenly carried out by the VOA Board of Governors. The BBC targets countries to promote trade and build national status. The charter of the VOA is to provide information to the nations where freedom of the press is limited or doesn't exist at all.

These are not-yet-developed nations without access to the same advanced technology as that in the United States, Canada, Australia and New Zealand — countries where the BBC has eliminated shortwave and substituted the Internet.

There are a number of us out here who understand all available technologies, not just those developed during the present generation. Balance is needed to optimize choosing between methods.

Unfortunately, that balance does not exist in our present International Broadcasting Bureau (IBB/VOA). Their own Internet survey results indicate only 8 percent of their audience is from VOA-targeted countries. Sixty-nine percent of the audience is from the United States alone. This is not cost effective.

I would encourage Radio World to

solicit knowledgeable opinion from experts, so that a proper balance can be examined.

Jack Quinn
International Broadcasting Consultant
Santa Rosa, Calif.

Ed. Note: Quinn is a former director at VOA who also worked for RFE and EIMAC.

BSI advertisement

The following letter was sent to Broadcast Software International and copied to Radio World:

BSI,
I'm puzzled as to what the point would be in using an apparent transsexual to sell your product lines (June 20, page 23). I personally found it distasteful and unnecessary. Also, the picture appears to be taken

Radio Expands Its Collective Brain

Convergence will sweep the industry soon — or so some analysts have been predicting for some time.

Recently we've seen two examples that demonstrate how the concept might work in the real, bottom-line world of consolidated radio.

First, Clear Channel signed a contract with the ad insertion service Hiwire, giving the company's 250 streaming stations a way around the American Federation of Television

and Radio Artists' Internet radio commercial provision. Separately, and shortly thereafter, the Local Market Internet Venture launched five beta streaming Web sites.

The LMiV is a consortium of radio competitors that have joined to tap the potential riches of the Internet. And the five founding members of the LMiV — Emmis Communications, Corus Entertainment, Jefferson-Pilot Communications, Bonneville International Corp. and Entercom — plan to launch the stations online via the LMiV.

The venture plans to launch 166 more Web sites before the end of the year, but it will still be far smaller than the big dog. Clear Channel's conservative streaming initiative includes only slightly more than a quarter of its radio stations.

Yet if all the technical and competitive glitches are worked out, the LMiV will accomplish something that its members could not do alone: deliver substantial aggregate audience numbers to advertisers.

It is time for radio to think of new ways to collect audiences to make its numbers attractive enough to sell ads that will pay for the Webcasts. For most radio companies, this may mean joining otherwise-unthinkable partners to make streaming profitable.

And because of the costs of streaming — the more listeners that you have, the higher your Webcast cost — radio will have to move in some bold ways to develop a business model for Webcasting. The LMiV looks like a step in the right direction.

— RW

(or at least enhanced to show this) in a BSI office due to the framed BSI logo behind the individual.

I would imagine this person has had quite a troubled life, and yet I would think it is the intent of BSI to make a mockery of their behavior to shock the reader. Not what is needed in our society today.

You have discouraged me from purchasing any of your products. Please use more discretion when selecting your advertisements.

Eric Eshbaugh
Fredericksburg, Va.

I agree. I have long championed the concept that trade shows need third-party audits, as exhibitor/marketers deserve and need a fair base of comparison. Our show, International CES, was the first major trade show to use an audit, and recently we released the results of our 2001 show audit.

I hope you continue to press on this issue and other journalists pick up your drumbeat.

Gary Shapiro
President and CEO
Consumer Electronics Association
Arlington, Va.

Show attendance

I greatly appreciated your May 23 column on the importance of third-party audits for expositions ("NAB: How Many Is Enough?"). You said:

"The only consistent, fair way to measure attendance at any convention is to count each body once; to separate statistically the paying visitors from the non-paid attendees, and the exhibitors from the attendees; and to have an independent third party audit the attendance figures and make those statistics public."

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Radio World

Vol. 25, No. 16 August 1, 2001

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NEXT ISSUE OF RADIO WORLD AUGUST 15, 2001

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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.

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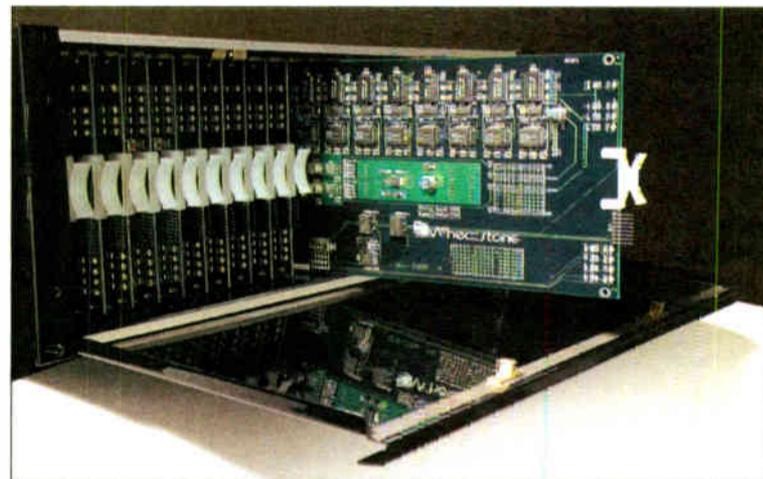
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