


S103723 DOB 9602
 THOMAS E BRAXTON 1
 MTS
 LUCENT BELL LABS/RM 2B-217
 2000 N HAPERVILLE ROAD
 HAPERVILLE IL 60563 1443 T1/2

Radio World®



**FM and
EAS
Buyer's
Guide**

See Page 62

Vol 21, No 21

Radio's Best Read Newspaper

October 15, 1997

CBS/ARS Highlights Show

*Record Attendance, Busy Exhibit Floor
As The NAB Radio Show Goes Solo Again*

by Leslie Stimson

NEW ORLEANS A mega-radio deal, a big public service announcement and record attendance made headlines at The NAB Radio Show in New Orleans.

Attendance topped all previous radio shows at 7,246, according to the National Association of Broadcasters. The attendance — about 5,000 pre-registrants and the rest on-site registrations — particularly pleased NAB President Eddie Fritts, who said the show never had broken the 5,000-mark, even during the three years that NAB took part in the World Media Expo with SBE, the RTNDA and SMPTE.

NAB added more technical sessions this year. To increase exhibit floor traffic, the organization also put promotions on the floor and set aside certain hours when no sessions competed for the attention of attendees.

Amid all the sight-seeing, riverboat riding and gumbo-eating, serious business was accomplished. Consolidation remained the buzzword in sessions and on the exhibit floor. The biggest industry news: Westinghouse/CBS signed a \$2.6 billion agreement to purchase American Radio Systems (ARS), heightening the excitement for some, bringing anxiety for others. (See story, p.8.)

The purchase announcement came as Karmazin was being honored at Thursday's Radio Luncheon. "I got into radio 30 years ago because I love radio," said Karmazin, as he was presented with the NAB National Radio Award.

Karmazin began his career as a New

York radio ad executive. He said, "I got into television because of a 16-dollar stock price. I want to be here as part of this community forever."

Of consolidation, Karmazin said Wall Street needs to wake up because analysts believe the multiples now being paid in radio deals are high.

"The radio business is growing at such a rapid pace, we're going to be able to show growth. When you look at the values that radio companies are able to offer their shareholders in the future, they're going to see that these prices have really been very cheap."

Chong touts the First

At the same luncheon, outgoing FCC Commissioner Rachele Chong warned that broadcasters must be vigilant in protecting their First Amendment rights. Issuing a call to action, she said, "During my term I have witnessed an insidious trend toward limiting the First Amendment rights of Broadcasters. Do it for the children ... for family values," Chong said. She compared broadcasters to frogs being slowly boiled in a pot of water. "Is the water getting warm yet?" she asked.

Citing the recent commission decision not to open an inquiry into broadcast liquor advertising, Chong said Congress should direct the FCC on programming

decisions, instead of allowing the FCC to act independently.

Of free air time proposals being championed in Congress and by outgoing FCC Chairman Reed Hundt, Chong said that airlines don't give away free seats, why should broadcasters give away free time?

High profile public service

The commitment of broadcasters to public service has been a political issue

See SHOW, page 8 ▶



NAB Joint Board Chairman Richard Ferguson joins National Radio Award winner Mel Karmazin and NAB President Eddie Fritts (left to right).

Radio Fees Strike a Few Raw Nerves

by Bob Rusk

NEW ORLEANS NAB Executive Vice President/General Counsel Jeff Baumann opened a Pandora's Box at The NAB Radio Show here when he asked broadcasters if they had a problem with the FCC's new regulatory fee schedule during an informal session "A Small Market Conversation With the FCC's Roy Stewart." Hands went up throughout the room.

Some broadcasters, who angrily spoke from their seats, called the charges excessive.

Stewart, chief of the FCC Mass Media Bureau, said the finger of blame should be pointed at Capitol Hill. "Congress has a cute trick that they played on you," Stewart said. He said Congress gave the FCC the same funding level as the year before, which forced the commission to increase fees in order to obtain additional revenue.

See FEES, page 11 ▶

RDS Receivers Make Inroads in Automobiles

by Lynn Meadows

WASHINGTON More and more car manufacturers, both foreign and domestic, say they will include Radio Data System (RDS) technology in their '98 models to be sold in the United States. The RDS industry hopes the change will spur broadcaster's interest in RDS.

Cadillac, Volvo, Mazda, Jaguar, Ford and Lincoln-Mercury plan to include RDS receivers either as options or standard equipment in some or all of their



This Jaguar and other models will be available with RDS.

1998 lines. An RDS receiver, for instance, would come standard in all Jaguar 1998 models.

With RDS technology, FM broadcasters can deliver a 1,200-bits-per-second stream of data on a sub-carrier. In Europe, RDS is used to switch receivers automatically to alternate frequencies for continuous reception of simulcast network programming.

Some stations in the states, most notably in Nevada and the

See RDS, page 18 ▶

The Next Generation Digital Console



Harris DRC 2000 Digital Radio Console

Harris is proud to introduce the next generation Digital Radio Console, the DRC 2000. Features include a new low profile design that emulates familiar analog consoles, minimizing operator training and on-site installation costs. The DRC 2000 is the world's most advanced digital radio on-air console. Yet, it provides the simplicity of the analog console operation. Best of all, it's ready to ship!

Harris Corporation Broadcast Division

1-800-622-0022
 FAX: 765-966-0623
 www.broadcast.harris.com



© 1997 Harris Corp.

Circle (165) On Reader Service Card

NEWSWATCH

Chancellor Forms Network

IRVING, TEXAS Chancellor Media Corp. has formed a national radio network, the AMFM Radio Networks. Former ABC Radio Networks President David Kantor will lead the operation as senior vice president. Kantor will report directly to Chancellor President/CEO Scott Ginsburg.

"With 99 stations in the nation's largest markets, the creation of a national radio network presents a tremendous growth opportunity for Chancellor Media," stated Ginsburg. "Under David's guidance we plan to leverage our existing syndicated programming, broad station base, personalities and advertising inventory to garner

meaningful market share and provide a strong platform for network advertisers," said Ginsburg.

FCC Approves Non-Comm Sale to C-SPAN

WASHINGTON The FCC approved the \$13 million sale of non-commercial WDCU(FM) from the University of the District of Columbia to C-SPAN on Sept. 24. The FCC received about 75 letters objecting to the sale. Most objectors argued that the public interest would be better served by retaining the station's current jazz format.

"While the commission recognizes that

WDCU(FM)'s jazz format has attracted a devoted listenership," wrote Mass Media Bureau Chief Roy Stewart, "it is well-settled commission policy that potential changes in programming formats are not considered in reviewing assignment applications."

The FCC found C-SPAN to be a qualified licensee and wrote the sale would serve the public interest. C-SPAN said it intended to keep non-commercial, educational programming on the station and would probably simulcast C-SPAN's audio at first (RW, Oct. 1.)

The sale raised concerns for outgoing chairman Reed Hundt, who stated, "All over the country, institutions like UDC

find themselves under pressure to bring in revenues. Will they, too, sell off their non-commercial stations?"

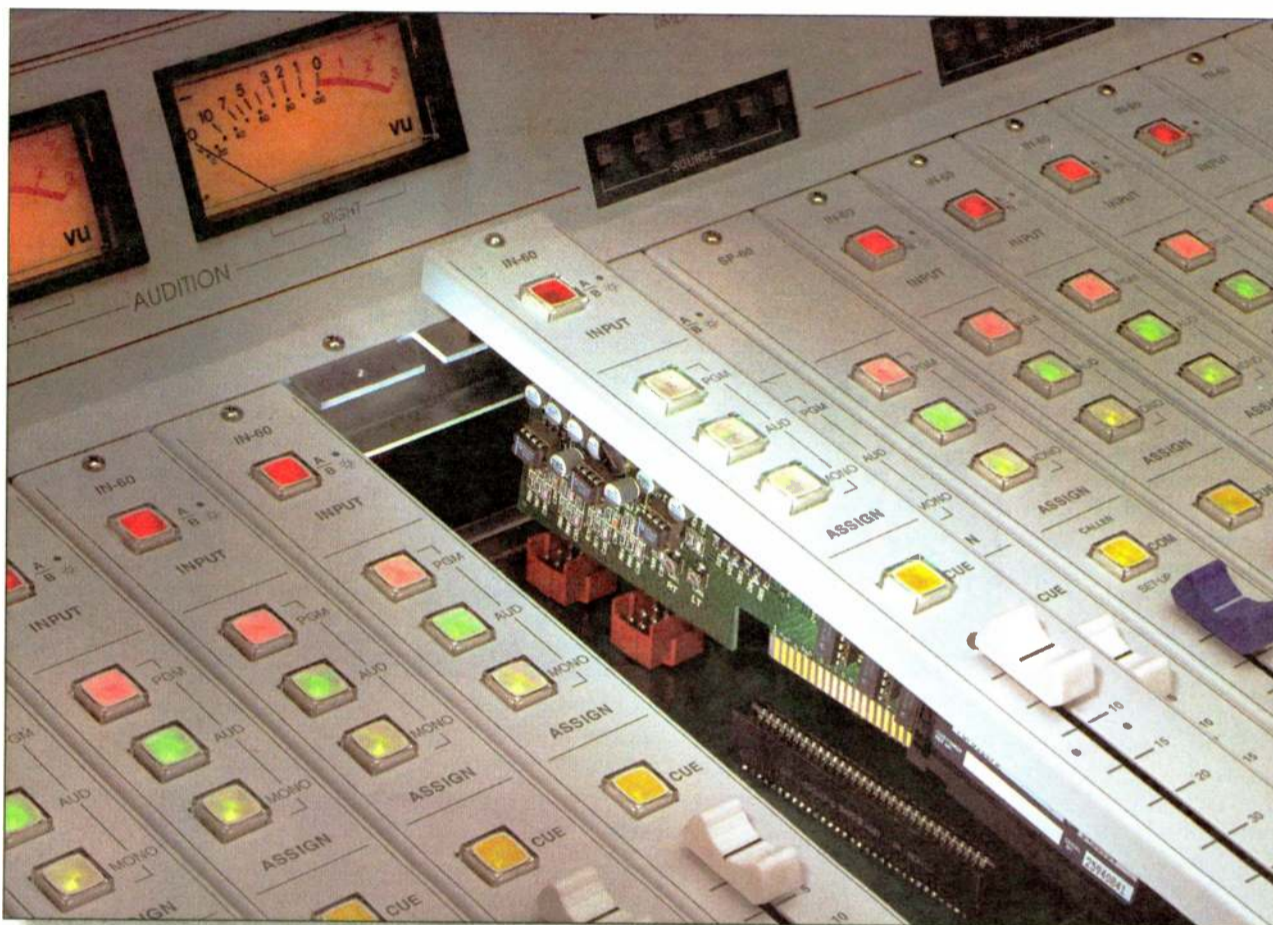
Hundt suggested the FCC gather facts about pressures on non-commercial licensees, and how the market is changing. Is there a special benefit, he asked, to educational institutions holding non-commercial licenses as opposed to national or regional non-commercial networks?

Seagram Adds 'Responsibility'

NEW YORK Seagram has added a six-second "responsibility" message to the beginning of all of its TV ads for distilled spirits, beer, coolers and wine. The company planned to add a similar message to its radio ads as well. Developed by Grey Advertising, the message to be used this

See NEWSWATCH, page 3 ▶

Take a LOOK at THIS:



Then look at our competition.

OF COURSE many stations are cost-conscious these days—just remember why you wanted a new console in the first place: to **UPGRADE**.

The **R-60** has what's needed, with all the right features: our **SIMPLE PHONE®** module for easy error-free talk segments; twin six bank preselectors, so you won't run out of input capacity; onboard machine control panel, clock, timer, a well-designed cue system, and a truly effective control room and studio monitor interface. And because it's totally modular, service is easy—even while you're on-the-air! Documentation: this can determine whether you have an installation day or an installation *week*. We've done it right to guide you through. And **PERFORMANCE?** Of course we've handled that; simply compare our specs.

DON'T MISS your opportunity to upgrade. Choose the R-60 radio console from **AUDIOARTS**.

FREQUENCY RESPONSE	
Line (10Hz-20KHz)	±1/10dB
Mic (20Hz-20KHz)	±1/10dB
THD+N (20Hz-20KHz)	
Line, +4dBu	.005%
Mic & Line, +16dBu	.005%
IMD (SMPTE)	
Mic & Line, +4dBu	.004%
DIM	
Mic & Line, +16dBu	.005%
DYNAMIC RANGE	
Line	114dB
Mic	98dB
HEADROOM	
ref +4dBu	24dB
OFF & ASSIGN ISOLATION	
1 KHz	-110dB
20 KHz	-105dB
BUS CROSSTALK	
1 KHz	-100dB
20 KHz	-75dB

7305 Performance Drive, Syracuse NY, 13212
tel 315-452-5000 / fax 315-452-0160
E-mail Wheatstone@aol.com



AUDIOARTS ENGINEERING

Circle (8) On Reader Service Card

World Radio History

Index

RUNNING RADIO

Quarter Ends With CBS Bang	21
by Lynn Meadows	
Plan Now for Happy Holidays	21
by Mark Lapidus	
Lines: To Cross or Not to Cross?	22
by Harry Cole	
Maltin Recalls Roots of Radio	25
by Bob Rusk	
Main Studio Rule: The History	26
by Harold Hallikainen	
High School Radio Lessons	28
by Neil Sanderson	
'All-Whale' Radio to Air in Canada	29
by James Careless	
Radio Disney: The Fun Begins'	30
by Chris Hamaker	
Tips to Keep Your Sales Staff Happy	30
by Chris Hamaker	
Equip Your Systems for the '90s	31
by Sharon Rae	

STUDIO SESSIONS

Burning Bytes With Yamaha CD-R	32
by Carl Lindemann	
Where Will You Be in Five Years?	32
by Alan R. Peterson	
dbx 286A: Big Bang, Few Bucks	34
by Ty Ford	
Mastercom Works at World Cafe	37
by Tom Vernon	
DAR Sabre Plus: DAW From England	38
by Keith Spencer-Allen	
Sony Deck Pulls Out All Stops	42
by Alan R. Peterson	

FEATURES

Inovonics Mini-Phone Exchange	44
by Dennis J. Martin	
Wire and Wire Not	44
by Brett Moss	
Disaster: The Forgotten Plan	45
by Thomas G. Osenkowsky	
Racing With the Olympus D-1000	46
by Paul Kaminski	
A Picture Paints a Thousand Feet	48
by Troy Conner	
Floodproofing a Transmitter Site	50
by James F. Pinkham	
Workbench	51
by John Bisset	
Harris Expo Continues to Grow	52
by Brian Galante	
Talking Tubes With George Badger	53
by Al Parker	
A Ribbon Is Not for Wrapping	55
by Ronald Pasha	
Chip Inspires Audio Tinkering	56
by Alan R. Peterson	
Telling It Like It Was, On Screen	57
by Dee McVicker	
A Killer Antenna for FM Radio	58
by Frank Beacham	
Omnia.fm Next Step in Processing	61
by Jeff Goode	

BUYER'S GUIDE

FM: On a Wave Toward Digital	62
by W.C. Alexander	
SBE Asks FCC for EAS Changes	62
by Lynn Meadows	
EAS: Some Are Still Choosing	65
Clean, Powerful, Punchy FM	68

Looking Ahead to a Kennard FCC

by Leslie Stimson

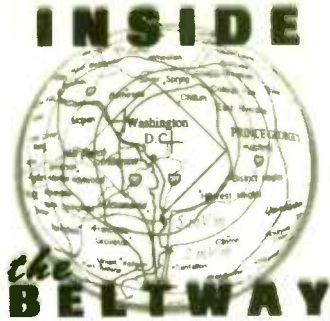
WASHINGTON As the end of September approached, the momentum to fill four FCC commission seats, including that of chairman, was picking up steam. The Senate Commerce Committee planned confirmation hearings on Sept. 30 for the three commissioner nominees: Harold Furchtgott-Roth, Michael Powell and Gloria Tristani. Sen. Fritz Hollings, D-S.C., pushed for a separate hearing, slated for Oct. 1, for the nominee for chairman, FCC General Counsel Bill Kennard. Although Hollings finally supported Kennard, he earlier pushed for the nomination of a former aide, Ralph Everett, as a rural candidate.

McCain, pushing

Senate Commerce Committee Chairman John McCain intended to get the nominees confirmed and sworn in during this month, noting at The NAB Radio Show that "a lame duck commission is dangerous." Once the hearings are complete and the committee sends them to the full Senate floor for a vote, and assuming they are confirmed, then they would be sworn in by a federal official (that could be an existing commissioner, a federal judge or a White House official, according to the FCC). Those plans were in flux at press time, taking into account the week the Senate takes off for the Columbus Day holiday. Once sworn in, the four have the authority to act as FCC

commissioners, which includes hiring a staff and voting on issues they regulate.

No one expects the four to be turned down, but observers expect some pointed questions on the controversial issues the



A Roundup of News and Comment Affecting Radio From the Nation's Capital

new commissioners would tackle. For radio and TV, that would likely mean whether to open an inquiry into broadcast liquor ads, how to handle TV stations' public service obligations as they transition to digital, and pending ownership issues.

These last — attribution and the relaxation or elimination of the radio-newspaper cross ownership waiver policy — are important. Who owns how much of a company and what companies own in a market are part of the considerations DOJ looks at in reviewing mergers. Officials at the convention said the DOJ's antitrust interests won't change as consolidation moves into the smaller markets. Craig

Conrath, chief of the DOJ's merger task force in the antitrust division, did admit there could be fewer competitors in the smaller markets.

On consolidation, McCain said the radio industry fared the best under the Telecom Act; others, like cable and telephones, have not been able to compete as well. (When the bill passed the Senate, McCain voted against the measure because he didn't think it sufficiently deregulated the industries the FCC oversees.)

Campaign finance reform is another issue near to McCain's heart. He said he didn't expect that the original version of his measure with co-sponsor Russell Feingold, D-Wis., would pass, and was now finalizing a "pared down" version. Free broadcast air time and 50-percent discounts off the lowest unit rates were not in the new version, but could be offered as amendments, he said. An aide said amendments were not yet set, nor was a date for a Senate vote on the bill.

In a speech at the show, NAB President Eddie Fritts said he expected the study by the so-called Gore Commission, looking at TV broadcaster public interest obligations, to include radio eventually.

Do it for the kids

"Do it for the children ... do it for family values," said outgoing Commissioner Rachele Chong of the pressures broadcasters face in the public service debate.

Chong warned broadcasters to be vigilant about protecting their First Amendment rights, comparing them to frogs being slowly boiled in a pot.

"Is the water getting warm yet?" she asked.

On the House side, how the FCC commissioners do their jobs was a hot topic at the convention. House Telecom Subcommittee Chairman Billy Tauzin, R-La., met with chairman nominee Bill Kennard for the first time privately in late September. No aides, just the two of them discussing what they want to see the commission accomplish soon. A Tauzin aide characterized the nearly one-hour meeting as "frank discussions, one-on-one about philosophies."

FCC reform ideas were bandied around as well. Tauzin, chairman of the Appropriation Subcommittee that funds the FCC; Rep. Hal Rogers, R-Ky.; and Rep. Al Wynn, D-Md., agreed that a year and a half after passage of the Telecom Act, the FCC remains too regulatory and they support shrinking its staff and narrowing its duties. Those sentiments were supported by Tauzin's predecessor, former subcommittee Chairman Rep. Jack Fields, R-Texas.

In the spirit of shrinking the FCC's size, Rogers said his committee denied the \$30 million the commission had requested to move to The Portals, another Washington location.

The commission has now received that money in a loan from the Government Services Administration and plans the first part of its move next March, an FCC spokesman said.

NEWSWATCH

► NEWSWATCH, continued from page 2
fall is "People of legal drinking age should enjoy alcohol responsibly, but don't drink if you're under 21."

Fritts: Broadcasters Donated Record PSAs

WASHINGTON NAB President and CEO Eddie Fritts wants to dispel some "mean-spirited myths" that the number of PSAs aired by radio and TV has dropped. Speaking to the Washington DC chapter of the Federal Communications Bar Association, Fritts said, "Local radio and television stations donated a record \$634 million in air time to Ad Council public service announcements in 1996, a 43 percent increase over the previous year."

Citing an example of public service, Fritts described the efforts of KMJ(AM), Fresno, Calif.

"The station decided to go after a man who was attacking senior citizens all over town. This guy was assaulting the elderly, knocking them down and roughing them up. KMJ initiated a 'CTB reward fund' — CTB for 'Catch the Bastard,'" Fritts said. "The station raised \$5,000 and brought such awareness, they are credited with the suspect's arrest."

Fritts intends to share broadcasters' public service efforts with Congress, the new FCC commissioners, state and local government and the Gore Commission. Of that commission, which is looking at redefining broad-

casters' public interest obligations, including the study of free time for politicians, Fritts said NAB would resist any attempts to "intrude" on broadcasters' First Amendment rights.

Outgoing FCC Chairman Reed Hundt has called for the commission to begin a major free time initiative. In a speech before the Annenberg Public Policy Center on Sept. 12, Hundt said TV was its second channel to transition to digital broadcasting "with the express statutory provision that this public property of the airwaves could be used only subject to a public interest obligation," which the FCC should define to include free time.

Lottery Ad Reprieve In 9th Circuit

WASHINGTON The FCC is not enforcing the ban against lottery ads in the 9th Circuit. The Court of Appeals for the 9th Circuit upheld a lower court ruling (Sept. 4), and denied the DOJ's request for another hearing. The policy of non-enforcement is effective unless the court's decision is overturned or changed. The FCC is making an exception — and will continue enforcement — in 9th Circuit states that don't have a state-conducted lottery.

The DOJ has until Nov. 24 to ask the Supreme Court to review the 9th Circuit ruling. The 9th Circuit includes: Alaska, Arizona, California, Guam, Hawaii, Idaho, Montana, Nevada, the Northern Mariana Islands, Oregon and Washington.

NEURAL WHAT?

Neural Network.

Neural networks are the next step beyond digital. They are a new technology emerging from university laboratories across the country.

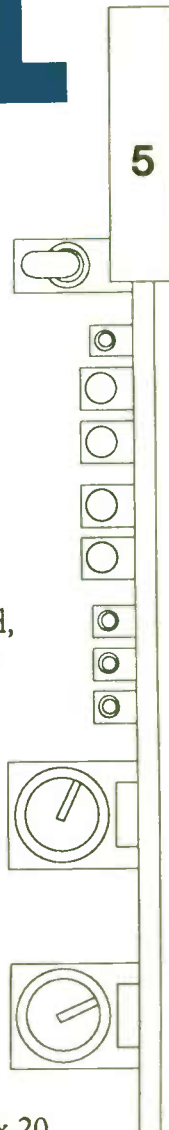
Now, neural networks power the most advanced, on-air audio processor you can buy. For under a thousand dollars, you can plug this new technology into your existing Optimod 8100*.

If you need more power and you need it now, call (800)806-5498. We'll do the rest.

CLARK
COMMUNICATIONS

208 West Hamilton Avenue - P.O. Box 20
State College, PA 16804-0020 - Phone: (800) 806-5498

* Optimod is a trademark of AKG Acoustics, San Leandro, CA.



Keep Those (Sub) Cards Coming!

WASHINGTON Remember when Radio Shack began charging \$3 each for its product catalogs? I can still remember the zinging letters to the editor we received from broadcast engineers everywhere incensed about having to pay for something that had, up until that time, been a freebie.

I am here to tell you right now, you can stop asking:

"Do I have to pay to keep getting **Radio World**?"

We've heard this question from several readers who heard that **RW** is now available via paid subscription. What does this really mean for you?

First, and foremost, **RW** continues to offer free subscriptions on a limited basis to those who qualify.

But why have some people received notices about paid subscriptions?

RW is "Radio's Best Read Newspaper." No marketing hype. It is the most used resource for radio equipment buyers, engineers, owners, managers, and operators and we've worked hard to make it better.

We send more than 18,000 copies, free, to radio readers who qualify and who return a subscription card. That makes us radio's No. 1 publication, and I am proud of that (everyone here is). Robert Green, who manages the **RW** circulation list, updates that free list regularly. As readers drop off because they stop returning subscription cards, he adds names of other people. Other free publications, by the way, follow a similar policy.

RW has been supported by our advertisers alone for 21 years. That has always been a boon to our readers.

However, there is a limit to the number of copies we can print every two weeks. The demand for **RW** outstrips the amount we can print and still keep our ad

rates reasonable. Don't forget, many of you read the newspaper for those very ads — ads that keep you current on trends in our business.



In the past we've had to turn away some people who would love to get **RW** but don't qualify because they are not in the business, or their station already gets copies, or some other reason. Some have asked if they could pay to receive **RW**, so we set up a method to let them do that for a nominal cost.

The reason some current readers received notices about paid subscription is that they have let their subscriptions

So they were taken off the subscriber list, and issues were sent to the next people on our waiting list.

So if you get **RW** and like it, be sure to return a subscription card, and fill it out completely. If you want to sign up, send us a card or letter. If for some reason you don't qualify for a free subscription, you can still receive it for \$29.95 per year.

You may be getting duplicate copies at your business address in the names of various people. Please let us know. Someone else wants those issues!

Robert asked me to tell you that if you have any questions regarding your subscription, please call him (same number as me, only ext. 161) and he will answer your questions.

In the meantime, if you have any thoughts on the editorial part of the paper, drop me a line or send me an e-mail at lcobo@imaspub.com

what all broadcasters are doing to serve their communities," said NAB President Eddie Fritts, pictured, who worked with the council's Smokey Bear to greet attendees on Thursday, Sept. 18.

The jazz was great, too, in the Big Easy, as was the food and the ambiance.

But the air of New Orleans was filled with more than jazz and public service announcements. It held romance, too.



Eddie Fritts and Smokey stand up for radio and public service.



Tom Rodman and Tracy Peterson announce their engagement during The NAB Radio Show.

Photo by Paul J. McLane

lapse — in other words, we did not receive a single response card from them, despite the many opportunities that each reader had during the past year to renew.

There was plenty of interesting news at The NAB Radio Show in New Orleans last month, and our next issue will wrap up the product show floor for you. By now you've read all about the top news from the show, CBS buying ARS and Hicks, Muse, Tate donating all that airtime and effort to public service. Something which radio is very good at as a rule.

In fact, the Advertising Council also announced that in 1996, it received more than half of the estimated \$928 million in donated media time and space for its public service campaigns from radio, a total of \$542.3 million, a 51 percent increase over the contribution radio made in 1995.

"The council survey is indicative of

Tom Rodman, Midwest region marketing manager for RCS, proposed to Tracy Peterson, corporate communications specialist for Broadcast Electronics. The setting: Pat O'Brien's restaurant in the French Quarter, at the stroke of midnight.

She said yes.

While **RW** is far too discreet to take a photo of such an event, we were in attendance the next day. As the exhibits came to a close at 6 p.m. Friday, Tom Zarecki of RCS took the mic at the company booth and announced the engagement to a crowd gathered around, and handed out champagne in paper cups. **RW** Managing Editor Paul McLane snapped the photo.

Peterson called the engagement "a merger of a different kind." No date had been set at press time.

Remote Control can be this easy.

BURK
TECHNOLOGY

7 Beaver Brook Road, Littleton, MA 01460
Phone 508-486-0086 • Fax 508-486-0081
email: control@burk.com

ARC-16
Transmitter Remote
Control System



AVAILABLE THROUGH:
**BROADCASTERS
GENERAL STORE, INC.**
(352)622-7700

For information and our new catalog, call TOLL FREE 800-255-8090

Circle (86) On Reader Service Card

World Radio History

READERS FORUM

If you have comments for Radio World, call us at (800)336-3045 or send a letter to Readers Forum (Radio World, P.O. Box 1214, Falls Church, VA 22041 or e-mail 74103.2435@compuserve.com or MCI Mailbox #302-7776). All letters received become the property of Radio World, to be used at our discretion and as space permits.

Buying non-comms

Dear RW,
The reduced public funding of public radio stations will make them a valuable profit source for aggressive operators. As public funds from NEA and other sources dry up, public radio stations will go to the FCC for further relaxation of the "Enhanced Underwriting" guidelines. Even now, it is hard to distinguish between enhanced underwriting on "non-commercial" stations and institutional advertising on commercial stations. This difference will become smaller in the future.

An aggressive noncommercial station operator in a major market should be able to obtain enough enhanced underwriting to allow paying a substantial management advisory fee to the associated com-

mercial venture. "It's a *cost* of operating the station, not *profit*."

Given the above observations, now is the time for broadcasters to form their nonprofit subsidiaries and buy all the major-market noncommercial FM stations that are available. The price will never be lower.

*Robert J. Carpenter
Rockville, Md.*

Morgan is a prince

Dear RW,

I was delighted to read your article "Morgan Looks to the Future" in the Sept. 3 issue. A tribute to a prince, a gentleman of the radio engineering fraternity. A quick vignette:

Susquehanna had just closed on the acquisition of KFOG(FM) in San Francisco, and Charlie Morgan was in the city to assess the engineering structure of the facility. At the time, I believe the summer of 1977, I was working with Eric Small. We had the exclusive domestic promotion and sale responsibilities for the original Optimod-FM, Model 8000A. Charlie paid us a visit and we chatted regarding the KFOG plant. All seemed to meet his approval, until he commented, "Jesse, but their antenna (mast) is upside down!"



Charles Morgan

Charlie was right: due to the FM and TV antenna congestion on Sutro Tower in the city, it was necessary to hang the KFOG mast facing downward from one of the tower platforms. We assured Charlie this phenomenon would not impinge on his pattern or Bay Area signal performance.

The positive on-going relationship between KFOG et al. and Susquehanna is in good part due to Charlie and his ability to surround himself with station engineering leaders and to continue to turn out a good product.

*Jesse Muxenchs
LaFayette, Ga.*

More Kalamazoo

Dear RW,

I was shocked to read the article "Billboard Wakes Up Kalamazoo" (Aug. 20), which sported a picture of the WRKR(FM) morning team in bed together and implied that no clothes were

Build The Future

In this space we have urged radio station engineers and managers to help develop the next generation of technical radio professionals. The Society of Broadcast Engineers shares that goal, and offers two scholarship programs to help.

It is an ominous sign that the SBE could award no scholarships for the 1997 year. The problem is not money; it is a shortage of qualified applicants.

The Harold Ennes Scholarship and the new Robert Greenberg Scholarship were set up to honor two men who made contributions to the broadcast engineering industry. The SBE awards these scholarships to individuals who have a career interest in the technical aspects of broadcasting.

According to a report in the SBE newsletter *The Signal*, the national SBE sent out more than 650 responses to inquiries about these scholarships for the 1997 year. Only 10 completed applications were received by the Ennes Scholarship Committee. Although the applicants showed "remarkable ability," they are not pursuing the study of the technical aspects of broadcasting.

The Ennes Educational Foundation Trust Scholarship Committee has issued a plea for help to SBE members: "Please check your local stations, schools and chapters for those individuals who could use the scholarships for technical career advancement."

We add our voice to theirs in asking our readers to help bring future broadcast engineers into the program. For information call (317) 253-1640. Perhaps next year on this page, we can report an encouraging increase in new engineers and engineering students. The alternative is a gloomy one: an increasingly technical industry with fewer and fewer technical experts.

—RW

Radio World

Vol. 21, No. 21 October 15, 1997

telephone: (703) 998-7600
editorial fax: (703) 820-3245

The editorial staff can be contacted at the phone extensions listed below.

- Lucia Cobo ext. 115 Editor in Chief
- Paul J. McLane ext. 117 Managing Editor
- Alan Peterson ext. 135 Technical Editor
- Leslie Stimson ext. 129 News Editor/
Washington Bureau Chief
- Chris Hamaker ext. 147 Associate Editor
- Susan Gary ext. 144 Assistant Editor
- John Bisset Technical Advisors
- Thomas R. McGinley
- Stevan B. Dana Publisher/CEO
- Carmel King ext. 157 Chief Operating Officer
- Marlene Lane ext. 128 Editorial Director
- Alan Carter ext. 111 Editor in Chief (International)
- T. Carter Ross ext. 137 Editor (International)
- Christine Joaquim ext. 138 Managing Editor (International)
- Rogelio Ocampo ext. 121 Latin America Managing Editor
- Marguerite Clark European Editor
- Linda Sultan ext. 141 Editorial Assistant
- Stephanie Muller ext. 130 Editorial Assistant

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 Giselle Hirtenfeld, P.O. Box 1214, Falls Church, VA 22041, (703) 998-7600, Fax: (703) 998-2966. Copyright 1997 by IMAS Publishing (USA), Inc. All rights reserved.

—PRINTED IN THE USA—

Next Issue of Radio World
October 29, 1997

being worn. The quotes in the article are shallow at best. Let's start with GM Ed Sackley who "never thought people would be so prudish."

Good grief, a GM who doesn't know his own back yard! The first sentence in the article attests to the fact that the area is conservative. So why the big surprise when you stick up 36 billboards with the staff in bed together? Sackley uses the phrase "vocal minority." Maybe it was a vocal minority that complained, and maybe they were so emotionally charged that they sounded a little silly on the phone, but I can guarantee you there was a non-vocal majority that were offended. It is basic radio: If you get a few calls on a favorite song or an issue, there are many more people who feel the same way.

Morning man Mike McKelly said, "People think we're spreading AIDS." What's one of the causes of AIDS? Multiple partners. What does this billboard look like? Multiple partners.

I think what has me most annoyed is the callous attitude of the station. Many stations probably would admit error, even if only for public relations reasons. This station reacts like a bunch of children acting like everybody else has a problem.

Also, you may be able to tune out an offending station but you can't drive with your eyes closed.

McKelly says, "Don't look to me to be a role model. I'm a morning radio guy." If your actions or words can be accessed by kids, you are a role model. You don't choose to be a role model. You just are when you are exposed to kids.

*Peter C. Nowinski
Production Engineer
WLUX(AM)
Farmingdale, N.Y.*

Love those MDs

Dear RW,

I liked Frank Beacham's article on archiving audio via MiniDisc ("MD: Archiving for the Rest of Us," Sept. 3). We here at WUPE/WUHN have been doing such archiving for the past two or three years. Our production department records and stores commercials on MDs and transfers the audio directly into the hard drives of the FM and AM on-air computers.

The WUPE/WUHN newsroom also uses MDs for all sound bites and intros. The other news departments in town have been wondering how we sound much better than they do.

We do use old-fashioned cassettes for some news conferences, but are bringing portable Sony MD technology to more and more press conferences. Our talk shows are also recorded on MD and used and re-used for various audio sources on newscasts.

Many of our talk shows are archived for later use in award presentations for the Associated Press and the Massachusetts Broadcasters Association. We are, as far as we know, the only radio stations in western Massachusetts to be using MiniDisc to this end. To put it simply: We love those little MDs.

Great article!

*Larry Kratka
News Director
WUPE(FM)/WUHN(AM)
Pittsfield, Mass.*

Write to Us

RADIO WORLD
READERS FORUM

P.O. Box 1214

Falls Church, VA 22041

74103.2435@compuserve.com

GUEST COMMENTARY

BSW: Dealers Serve a Vital Role

*A Leading Radio Equipment Seller Says:
Don't Forget What Your Dealers Do for You*

by **Tim Schwieger**
President
BSW

This commentary is in response to the story "SFX Broadcasting Deals Direct for Equipment," RW, Sept. 17.

In Frank Capra's classic movie "It's a Wonderful Life," an angel shows the forlorn character played by Jimmy Stewart what his town would have been like if he'd never been born. That glimpse turns him around.

While I'm surely no angel, I'd like to help broadcasters — whether major group owners or individual entrepreneurs — appreciate the clear advantages of working with equipment dealers.

What if dealers did not exist? The answer is clear. Without the added value of the dealer, there would not be:

Competitive pricing. The dealer's tremendous buying power means you get lower prices. Because we buy in volume much greater than even the largest group owner, we can pass the savings on to you, regardless of your size. Competition among dealers for your business means you're not likely to pay list price, ever. Remove the competition and watch what happens to prices.

Easy comparison shopping. Whether on the phone or on line, dealers have trained staff to help you identify the right products for your applications. Dealers have no self-interest in pushing only one component. Our comprehensive product catalogs, trade show exhibits, and on-site demos are geared to giving you all the options, not just those of a single manufacturer.

One-stop shopping. With consolidation, tight budgets and the constant churn of new products, your time is your most endangered asset. A quality dealer can do all the legwork for you. By drawing on the offerings of hundreds of manufacturers, a dealer can assemble a variety of packages to furnish a studio, a complete station start-up or rebuild in "no time" and at no cost to you.

Reliable, dependable, timely delivery. Lead times from factories typically run two to six weeks. Our extensive inventories mean you get the gear when you need it, not when the manufacturer says so.



BSW President Tim Schwieger

Flexible credit terms and billing options. A dealer acts like a bank, offering various payment options. One credit application with a dealer gives you access to a universe of purchases. Each manufacturer has its own payment requirements, often with very strict credit terms, if available at all.

Easy exchanges and returns. The dealer bears the brunt of any hassle with the manufacturer.

A powerful advocate in the marketplace. Dealers are a key intermediary between you and manufacturers. We take what we learn day in and day out from hundreds of engineers directly to manufacturers. Your input paired with our purchasing clout can prod manufacturers into responding more quickly to your needs.

This list could go on and on. But I've made my point: Dealers add convenience and value to every transaction at no additional cost to you.

No one wants to pay too much for anything. Dealers appreciate this as much as you do.

So, the next time you think that buying direct is the best route, remember: Bypass dealers and say good-bye to extensive product selection, low prices, comprehensive product information, accessible equipment demos, financial options and timely delivery. Stick with dealers and we'll help you earn your wings.



Tim Schwieger is president of BSW-Broadcast Supply Worldwide, a broadcast audio equipment supplier in business since 1973. He is a former radio broadcaster with experience in programming sales and engineering.

RW welcomes other points of view. Write to us at the address on page 5.

Columbine JDS Acquired By Big Flower Press

GOLDEN, Colo. Columbine JDS Inc. was acquired by Big Flower Press Holdings Inc. Terms of the deal were not disclosed.

Columbine JDS, a privately-owned company, is a provider of computer-based management systems that automatically manage the placement of broadcast ads, programming and sales information for radio and TV stations, group operators, networks and other customers. The company said it processed approximately 60 percent of all domestic electronic media advertising dollars spent in 1996, or approximately \$30 billion, producing revenues of about \$60 million. Executive Vice President and COO Doug Rother said the company has more than 520 employees in six offices around the world, and that he anticipated no staffing reductions. "In fact, we're rapidly hiring and ramping up," he said.

Big Flower Press Holdings Inc. is an

advertising and information services company, specializing in ad insert programs, circulation-building newspaper products, image management, specialized direct mail products and fragrance samplers. It is traded on the New York Stock Exchange. Big Flower President Edward T. Reilly said the broadcast digital management capabilities of CJDS and the print digital management capabilities of Big Flower's Laser Tech organization create a powerful full-service ad management system.

Asked where his radio business is heading in light of consolidation, Rother of CJDS said the company "predominates" in larger markets, and that CJDS is accustomed to dealing with small numbers of large companies, as in the cable industry. He said radio groups are expressing more interest in corporate reporting and sales analysis, which he said is a strength of CJDS.

— Paul J. McLane

NY AM Burned Out After 40 Years

by **Lee Harris**

NEW YORK Radio station fires, while often devastating, are rarely fatal to the station.

When the studios and offices of WVIP(AM) in Mt. Kisco, N.Y., were destroyed by fire, it appeared that the station would make a quick and remarkable comeback. That initial impression turned out to be very wrong, but it is still not clear if the fire was the cause of the demise of WVIP, or merely the final blow to the faltering AM daytimer.

WVIP Owner Martin Stone was preparing to celebrate the 40th anniversary of the station when he got word that flames had ravaged his architecturally unique facility, known locally as "the studio in the round."

Late-night fire

The fire broke out late on the night of Sept. 10, while the station was off the air. Despite a quick response by the Mt. Kisco Fire Department, the circular building was a total loss. The news was too much for the 82-year-old Stone, who had to be rushed to a nearby hospital with chest pains.

Even without Stone to direct them, WVIP staffers began scrambling to get the station back on the air. Luckily, the on-site transmitter was housed separately from the rest of the operation, and it was untouched by the fire. With engineering help and some equipment donated by competitors WVOX (AM) and WWCY(FM), WVIP was back on the air by 9 a.m. the day after the fire; broadcasting from a makeshift studio in the tiny transmitter shack.

Operating conditions were less than ideal and WVIP was missing much of the material that goes into a broadcast day. All the music, commercials, and necessary paperwork had gone up in flames.

Under the circumstances it was impossible to continue with the station's heavy local news commitment, but the on-air staff ad-libbed live spots and patched together a semblance of the adult standards format with donated or borrowed CDs.

Marathon broadcasts

Program Director Don Stevens said broadcasting was "more like a marathon, with us talking about the situation, and inviting sponsors to drop by and talk about their businesses, in lieu of recorded commercials."

Conditions improved a little the following day, when a trailer donated by a local business was moved into the WVIP parking lot. For the next three days WVIP carried on, using a Radio Shack mixer as an on-air console. On Saturday, Sept. 13, the staff and volunteers threw a block party to

See WVIP, page 7 ►

Stereo Field Mixer

NANOAMP SERIES™ MXS100 Stereo Three Input Mic/Line Mixer

- Quiet Mic/Line Inputs • Phantom Power
- Program/Cue Headphone • Lo-cut Filters
- Slate Mic and Tone Osc. • Bright 3 Color Meters
- Limiter • 10-30 VDC Ext. Power

AUDIO TECHNOLOGIES, INCORPORATED



328 W. Maple Avenue,
Horsham, PA 19044
Tel: (215) 443-0330 • (800) 959-0307
Fax: (215) 443-0394 • <http://www.atiguys.com>



Call or
write
for
free
detailed
brochure.

Circle (125) On Reader Service Card

World Radio History

► WVIP, continued from page 6

thank the community for standing by WVIP and helping out in their time of need.

Hundreds of people turned out for the festivities outside the burned-out studios on Radio Circle, and congratulated the staff and volunteers for their resourcefulness in returning WVIP to the air. That is when Martin Stone phoned in a special message from his hospital bed. It was not the message listeners and supporters were expecting.

In addition to thanking everyone for their support, Stone explained that he was shutting down WVIP until normal operations could resume. He did not say when that would be.

Gone ... for now?

Once Stone had given what seemed to be his farewell, WVIP played a tape of its very first broadcast, from October 1957. Then the station signed off.

Many listeners assumed that they had just heard the last of WVIP. Program Director Stevens thought the message had a more ambiguous tone.

"He never said that we would be off completely. His wording was that broadcasting would be suspended so that we could rebuild and go back to normal operation. That can be interpreted several ways, but to infer that we would never be going back on the air was the wrong assumption."

That may be the case, but Stone has not given his employees anything resembling a commitment to return to the air. While Stevens and a few other employees remained on the WVIP payroll, answering the phone in the trailer, it was unclear how long they would continue to do so. Stone was said to be evaluating the loss, his insurance coverage and the feasibility of rebuilding the station, which according to insiders was not very profitable.

Prospects for a sale of the burned out station are also iffy. Even AM daytimers still fetch a decent dollar in the New York market, where there's an actual shortage of airtime for brokered and foreign language programming. But the WVIP directional pattern shoots straight into the wealthiest part of Fairfield County, Conn., and away from the communities which could be served by ethnic-oriented radio.

Another AM station attempting to

serve the well-to-do portion of Fairfield County recently pulled the plug of its own accord, after failing to find a buyer. WMMM in Westport, Conn., was donated to Sacred Heart University, which is expected to program the station with a public radio version of news/talk.

Stone, who is reportedly staying with relatives, has been unavailable to talk about the tragedy.

But some of the people who have worked for him over the years speculate that the dedicated broadcaster may prefer to let WVIP go out with its reputation intact, rather than see it become a simulcast facility, a satellite automation outlet, or worse.

For now it appears that it's R.I.P. for WVIP.



Burned Out Remnants of WVIP(AM), Mt. Kisco, N.Y.

Use the *HotLine*

...when ISDN doesn't make sense

One-time remotes just got easier!

Sometimes it's impractical to install a special circuit like ISDN for a one-time remote. However, a plain telephone line is usually available. Wouldn't it be nice if you could have high quality two-way audio on that plain line? That's just what you get with the *HotLine*.

Special introductory price: \$2995

Call us for details
800-237-1776
<http://www.comrex.com>

COMREX
We make great connections

Wideband two-way audio on POTS
 (Plain Old Telephone Service)

COMREX Corporation, 65 Nonset Path, Acton, MA 01720 USA Tel: 508-263-1800 Fax: 508-635-0401
 Email: info@comrex.com Fax-on-Demand: 508-264-9973 Toll-free: 800-237-1776 in North America or 0-800-96-2093 in the U.K.

NEWSWATCH

Consumer Electronics Sales Up

ARLINGTON, Va. Sales of consumer electronics will reach nearly \$73 billion this year, predicted the Consumer Electronics Manufacturers Association (CEMA.) The 1997 total would be a six percent increase over the year before.

CEMA cited continuing demand for home office equipment and growing interest in new digital technologies for the increase.

Products included for the first time in CEMA's forecast included: digital versatile disk players, TV/PC combinations, home theater-in-a-box, computer printers and monitors, modems/fax modems and digital cameras. Other products traced included: Direct to Home satellite systems, HiFi/stereo VCRs, CD players, compact audio systems, and home radios.

Cap Cares: Radio Reaches Out

► **SHOW**, continued from page 1
this year. A major broadcast chain used the show as a platform to make an announcement on this topic.

Hicks, Muse, Tate & Furst and the two media companies in which it has a financial interest, Chancellor Media and Capstar, launched a national program,

**THE NAB
RADIO
SHOW**

"Cap Cares — Radio Reaching Out," designed to strengthen the bond between stations and the communities they serve.

The Cap Cares program includes a major alliance with Big Brothers/Big Sisters. During the announcement on Sept. 17, Hicks, Muse presented Tom McKenna, executive director of Big Brothers/Big Sisters, with a check for \$100,000 to kick off the partnership.

NAB President/CEO Eddie Fritts said quantifying each radio station public service effort is a problem, because stations do their own outreach efforts locally. Fritts called the program "a major first step," one that he hopes other stations will follow. Fritts said the

Hicks, Muse initiative is "indicative of what all of radio does for our local communities."

Cap Cares is a national program that will be implemented locally in every Capstar radio market. Capstar pledged to expand its commitment to local

"Beginning this year, we will raise \$5 million annually for our new charitable foundation," said Capstar Broadcasting Partners President and CEO Steve Hicks, who was a Big Brother volunteer in college 25 years ago. "We will also commit over \$100



Pictured Left to Right: Scott Ginsburg, Chancellor Media; Rick Neuman, Hicks, Muse, Tate & Furst; Eddie Fritts, NAB; Steve Hicks, Capstar Broadcasting Partners; and Tom McKenna, Big Brothers, Big Sisters.

news, sports, weather and public affairs programming, equal opportunity employment and support of minority ownership.

million of air time towards public service announcements in 1998. These PSAs will have a strong emphasis on local activities and organizations."

Getting on-line

Consumers like getting on-line because it's convenient, it's a trend and a natural fit for radio. That's what AOL President/CEO Robert Pittman said during his keynote address.

"The business we're in is convenience in a box. Think about the word processor. What does it do that you couldn't do before? Nothing. It just does it a lot simpler."

But Pittman raised some eyebrows in the crowd when he stated, "We do have a small group of people I politely call the technology early-adopters that exist in this market. They are the people who don't have a life. They are the computer-obsessed. If you try and predict this industry, the mistake that's being made today is that a lot of people listen to those folks as experts. But let me tell you, every industry has people who don't have a life."

"I remember them in the radio business — the person who calls you all the time on the request line or on a talk show. If you ask them what's the perfect radio station, they would create a station that no one would listen to. As we look at every business, you have to look for these folks and not be steered wrong."

The Internet is a place to meet listeners, he said. "You want to meet your listeners where they are. ...They think the Internet is important."

Pittman stressed the importance of random access on the Web, which allows listeners to look up other information at their convenience.

Consolidation to continue

Big group owners and owners in small markets alike expect consolidation to continue and move into the smaller markets.

CBS Buys ARS in \$2.6 Billion Deal

NEW ORLEANS Rumors that American Radio Systems was in play finally quieted with the September announcement that Westinghouse/CBS signed an agreement to buy ARS for \$2.6 billion.

If the marriage of Westinghouse/CBS and ARS, the fifth-largest radio group, receives federal approval, Westinghouse/CBS would have a total of 177 stations. The deal is expected to close in the second quarter of 1998.

With the ARS acquisition, Westinghouse/CBS widens its lead to 42 percent as the largest radio group based on BIA's estimate of gross revenues (about \$1.4 billion). This would move the Hicks, Muse, Tate & Furst-owned Chancellor Broadcasting (\$816 million) to number two and Capstar Broadcasting (\$586 million) to number three.

Under the agreement, Westinghouse/CBS would acquire ARS broadcasting operations for \$44 a share or \$1.6 billion in cash, while assuming about \$1 billion in debt. The deal does not include ARS' tower business, which ARS intends to spin off to shareholders.

"The acquisition of American Radio is financially and strategically attractive for CBS," stated Mel Karmazin, Chairman/CEO, CBS Station Group. "This investment will significantly strengthen CBS' position in the fast-growing radio industry. It will enable CBS Radio to expand into new top-50 markets and increase its position in its existing major markets."

— Leslie Stimson and Sharon Rae

Group owners debated whether prices will continue to rise, and small owners fretted about the increasing difficulties of finding financing for deals under \$2 million. Lenders and deal-makers alike said smaller market owners should be creative about financing their purchase and include a clear business plan to show potential investors how they'd recoup their investments. The best advice: develop a relationship with a lender before you need a loan.

DAB

Engineers at USA Digital Radio said their mission to develop in-band, on-channel digital audio broadcasting is closer to reality. The group said the joint development partnership of Westinghouse and Gannett with Lucent Technologies/Bell Labs has given steam to those efforts.

The group said it is in the second phase of a four-stage development plan for DAB, and demonstrated computer simulations of IBOC AM and FM using Lucent's PAC algorithm.

The group said it expected to make major progress toward a marketable system for the United States in the next year or so.

AM Transmitters

Digital Solid State

Every day we live up to promises we made 10 years ago...

"It's basically done everything you said it would. The transmitter is paying for itself all of the time...we're mighty thrilled!"

"Factory support for any product is very important to me and I could not have asked for better support. They are exceptional!"

"That little box outperforms my most optimistic expectations!"

"The move to the Omnitronix solid state transmitter has resulted in a significant decrease in the cost of power, has produced much higher quality broadcast signal, and this has taken away many of our worries of staying on the air."

"IT WORKS GREAT!...We are the loudest and cleanest sounding AM radio station in Atlantic City. I guess you can add us to your long list of satisfied customers."

"There is no question, you folks go the extra mile to see that your customers are satisfied."

... We invite you to join our Fan Club.

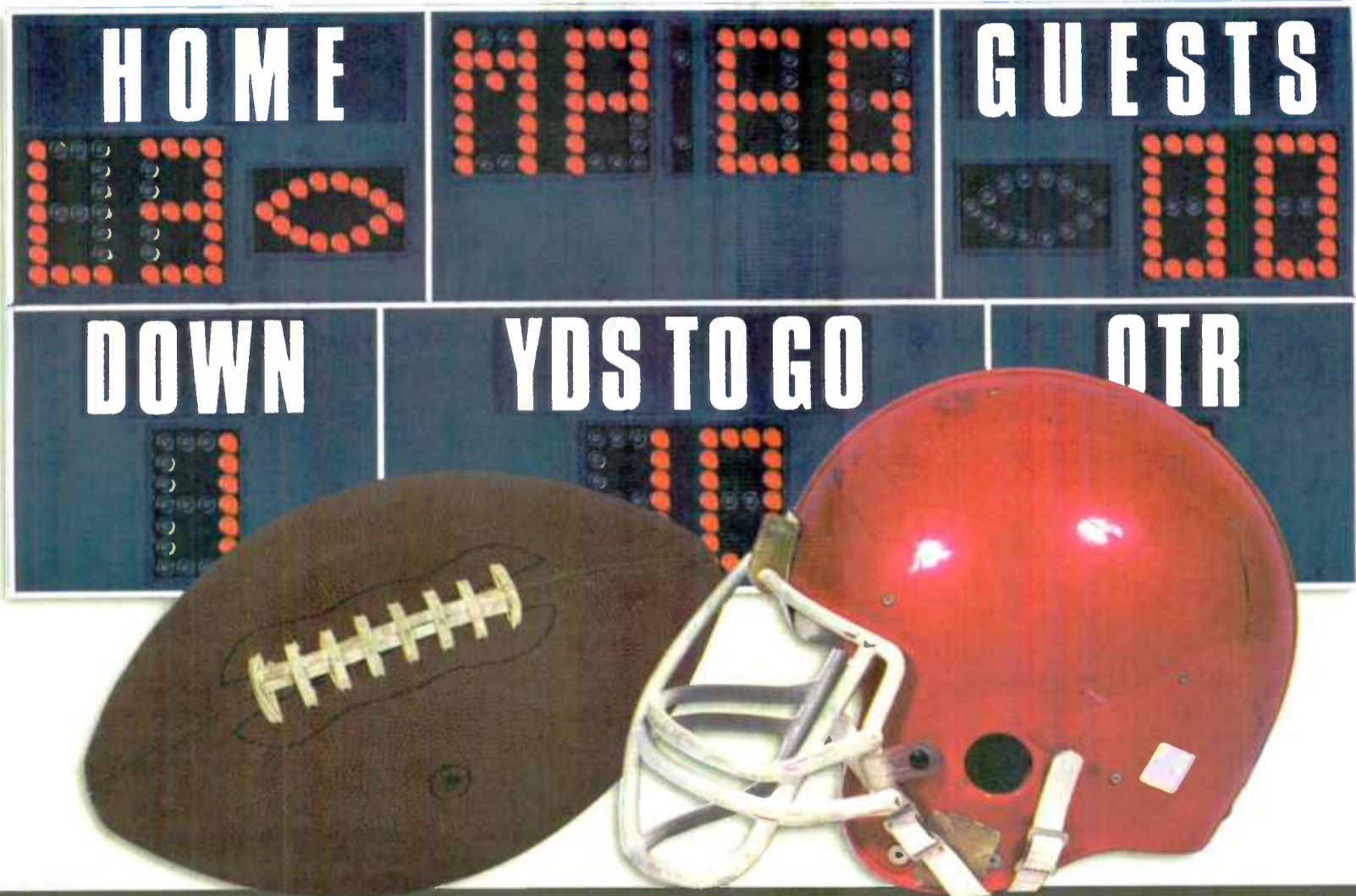
OMNITRONIX INC

Fresh Ideas, Smart Design.

e-mail inquiries: info@omnitronix-inc.com

113 DICKERSON RD, N WALES, PA 19454 • (800)446-6648 • (215)699-2400 • FAX(215)699-2323

FIELD GOALS



Telos Zephyr: The Best Way to Hear from There™



In live-remote broadcasting, as in football, the ability to maneuver around obstacles in the field allows you to reach your performance goals. With its easy setup and reliable operation, Zephyr proves to be your most valuable player, offering exceptional performance and speed on any playing field.

Zephyr is the best sounding, lowest cost way to send high-quality audio over ISDN. Once it's programmed, anyone can Auto Dial ISDN calls.

Not sure what to do next? Press the help button for simple instructions.



Zephyr is full-duplex for two-way transmission. And you don't have to worry about what codec is on the other side—with Layer III, Layer II, and G.722, Zephyr can handle whatever is thrown at it. Better get a Zephyr before the season's over . . . it's tough to score when the penalty flags keep flying.

- The ideal solution for remote broadcasts, ad hoc networks, voiceovers, distribution of commercials, backup to satellite and microwave links, and many other applications.
- Designed by Telos System for audio applications over ISDN.
- Optional AES/EBU digital audio input/output module with sample rate conversion.
- Clean, uncluttered front panel for simple operation. Full metering, call duration timer, head-phone jack, and mic/line inputs.
- Built-in input protection limiter. When your talent screams, your audio doesn't distort.
- Zephyr has an integrated ISDN terminal adapter designed for the non-technical operator. You can even place a standard voice-grade call to a Plain Old Telephone Service (POTS) telephone.



2101 Superior Avenue, Cleveland, Ohio 44114 • Telephone: 216.241.7225 Fax: 216.241.4103 • <http://www.zephyr.com> • e-mail: info@zephyr.com

Telos Systems, the Telos logo, Zephyr, and The Best Way To Hear From There are trademarks of TLS Corp. Other trademarks are the property of their respective holders.

Circle (163) On Reader Service Card

World Radio History

Test drive theirs then test drive our DigiCart®/II Plus.



We've got more under the hood.

In fact, a lot more. We've just added a built-in Zip™ drive and D-NET file transfer network.

You'd think all that would add to the cost of the unit.

Not so. The price of DigiCart/II Plus is the lowest it has ever been. And, it's still got the reliable features you've come to expect from DigiCart recorders. It stores almost

50 hours of audio on hard disk, provides instant access to thousands of cuts, and has your choice of Dolby® AC-2 or true 16-bit linear recording.

We invite you to take it out for a test drive and make the comparison.

We're that sure that after you test drive it, you'll want to park it at your place.



Attention call letter stations.* You're only a phone call away from a free 10-day Test Drive.

So try it out. We'll understand if you don't give it back.

(818) 991-0360

360 Systems®

PROFESSIONAL DIGITAL AUDIO

For more information call (818) 991-0360 / Fax (818) 991-1360 / e-mail: info@360systems.com / Website: www.360systems.com

*Offer good in U.S. and Canada only.
© 1997-360 Systems

Circle (7) On Reader Service Card

World Radio History

Anger Over Fees

► FEES, continued from page 1

The schedule first called for fees to be based on the class of license. Under that schedule, for example, a Class A station in a small market would have paid the same amount as a station in New York. A change was made, Stewart said, after small-market stations complained.

"Now that New York City station will pay \$2,000," said Stewart, "while the Class A (small market) station will pay about \$200. The redress was based upon the population" that each station serves.

Stewart said, "We readjusted it based upon the population within the protected contour of the station." However, he acknowledged that to date the commission had received "about 40" complaints

rules) would be used to determine station population. This is the 0.5 mV/m contour for AM stations, and either the 60, 57 or 54 dBuV/m contour for FM stations.

"NAB staff analyzed the data and ultimately made the recommendation to the FCC regarding the regulatory fee structure," said Brandenburg. "It is my understanding that the FCC modified the NAB proposal somewhat before adopting it."

Brandenburg stated, "All concerned parties should be advised that the absolute population count is not what is paramount." He said the count is actually used as an index of comparison between stations. Thus, he said, it seems entirely reasonable to use a smaller contour, such

as City Grade (5 mV/m for AM stations and 70 dBuV/m for FM) to determine population.

"The population tiers will be adjusted after the data is completed," said Brandenburg. "Although this will not have a widespread effect on the fees, it should provide relief to stations suffering from the fringe-area issue. Discussions are underway with NAB regarding the contour value change and updating the database."

Angry audience

During the NAB session, one broadcaster in the audience shouted, "Why didn't the NAB stand up for us before? Why are you suddenly going to take some action?"

Baumann replied that the NAB did propose basing fees on the class of license

and population served. "The FCC did not follow the formula that we gave them. We have not given up. We intend to go forward," he said. Baumann added that while "this year's fee schedule is in place ... you can file for individual relief."

Stewart of the FCC said, "I'm not sure you're going to get relief. I'm not going to promise you that."

But, he said, "I think we should do it right. If you'll help us and give us guidance, I think the (FCC) has a responsibility to make fair, accurate decisions."

"I don't think that the FCC should close the federal deficit on the backs of broadcasters. But if they've told us that we need to raise the money to make the agency function, then we have to have some regulatory fee scheme. The question is, working together, can we adjust it so it's a fair scheme?"

Why didn't the NAB stand up for us before?

— Session attendee

from stations whose managers remain displeased with the schedule.

"People are arguing about whether or not it's fair to include all of that population within (the) contour. We're going to have to work our way through it."

A question of contour

Two of the broadcasters who spoke at the session were typical of the many who voiced anger. One operates a small-market Tennessee station, whose signal overlaps into the Knoxville area. The other operates an AM daytime-only station 60 miles north of New Orleans in a county with a population of 40,000 people. The commission claims the signal covers a population of 1.3 million; thus the station's fee was \$1,400.

Baumann said, "Because of the contour used by Dataworld — which is where we got the database to submit to the FCC — it's a much larger contour than most stations feel they really serve." Bauman expressed a desire to work with the research and data supplier to come up with a "more realistic contour — for AM (stations) in particular.

"It's been suggested," he said, "that the (5.0 mV/m contour) would be much more realistic than the (.5 mV/m). From what I understand, it would eliminate most of the problems, particularly if you're next to a major metropolitan area. That's what we intend to do. We intend to work with Dataworld and the FCC."

Dataworld responds

Dataworld received angry phone calls from broadcasters who took this explanation to mean that Dataworld had not done its job correctly.

Executive Vice President Hank Brandenburg told RW that his company does not engage in recommending or setting policy, that Dataworld simply is a data provider. Brandenburg said the NAB had contacted the firm in the summer of 1995 to ask Dataworld to calculate the population for all radio stations, and provide them with a database containing the results. After that discussion, said Brandenburg, "it was decided that the protected contour value (from the FCC

Rack Up Savings

BSW combines high-quality, great sounding Technics machines with BSW's custom, rack mount hardware to offer you tremendous equipment values.

\$169.95



STK550R AM/FM Tuner

- Excellent audio quality
- 30 presets for AM and FM
- Nondestructive preset memory
- Includes RK6 rack kit



\$199.95



RSTR373/RK4 Dual Cassette Deck

- Super fast FF and RW
- High/low speed dubbing
- 24-hour continuous playback
- Includes RK4 rack kit



\$258.95

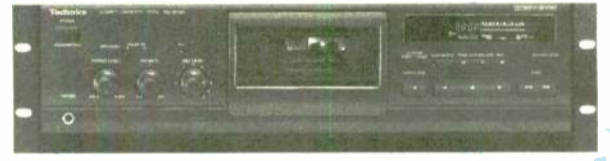


RSTR575/RK4 Dual Cassette Deck

- Record and play from both decks
- High-speed program search
- 3-hour continuous record/ 24-hour playback
- Includes RK4 rack kit



\$239.95



RSBX501/RK5 Single Cassette Deck

- Auto reverse
- Dolby B, C and HX Pro
- Headphone jack with level control
- Includes RK5 rack kit



Call us with your order today to rack up savings!

1-800-426-8434

BSW Offers a Better Value!

- Lower prices on all professional audio and broadcast equipment
- The most comprehensive inventory representing over 200 manufacturers
- Knowledgeable sales representatives with broadcast and studio engineering experience
- Fast, customized delivery to meet your needs
- Integrity, support and lasting commitment to you

Equipment Solutions To Keep You Number One

BSW

BROADCAST SUPPLY WORLDWIDE

7012 27th Street West Tacoma, WA 98466 USA

Fax: 800.231.7055

Website: <http://www.bswusa.com>

Circle (46) On Reader Service Card

Baseball Moves to ESPN Radio

by Chris Hamaker

NEW ORLEANS ESPN Radio has acquired the exclusive broadcast rights for Major League Baseball (MLB) games during both the regular season and post-season.

The agreement was announced Sept. 17. ESPN Radio General Manager Drew Hayes called the contract the "crown jewel property" for the radio network, which includes broadcast rights for the World Series, the All-Star Game and the "ESPN Sunday Night Baseball" game of the week.

Hayes said ESPN Radio had been trying "for an extended period of time" to

acquire the broadcast rights to Major League Baseball, which have belonged to CBS since 1976.

CBS had made it known in recent weeks that it was ready to take an aggres-

sive approach in its bid to win back NFL rights, and now faces a setback with its

baseball coverage. CBS officials declined to comment on the matter.

The line-up

Hayes was gleeful as he discussed the MLB acquisition and the sports programming ESPN Radio had lined up.

"We're looking at this as a palette, and we're going to paint a hell of a picture," Hayes said. "Major League Baseball ... will go side by side with the NBA on ESPN." Hayes said the play-by-play baseball and basketball programming complements the network's long-form talk programming, which includes "The NFL on ESPN Radio" and "College Football GameDay."



The MLB deal also included broadcast rights for: The Home Run Derby and All-Star Gala the day before the All-Star Game "Pennant race" games in September One game each Saturday in September.

More than one game on Opening Day and every holiday The 1997 Expansion Draft.

Aggressive plans

Allan H. (Bud) Selig, chairman of the Major League Executive Council, said of the agreement, "ESPN offers some exciting promotional opportunities that we are certain can make Major League Baseball radio broadcasts a more effective part of our broader marketing strategy."

Hayes acknowledged the public relations damage incurred in recent years by baseball players and teams, but called the deal "an aggressive step for baseball marketing." He said, "We'll cross-promote the games on TV and give the fans the full flavor of the game, not just balls and strikes."

Hayes also said he would like to find a "signature voice" for the ESPN Radio baseball broadcasts. "We're going to try to get some magic into (the broadcasts)," he said. "I want us to do great things."

Keep a Clean Record on EEO

Keeping good EEO records is the key to compliance, said David Oxenford Jr., Fisher Wayland Cooper Leader & Zaragoza, at a session during The NAB Radio Show.

A good system includes self-assessment to determine if your minority job recruitment sources are working for you. If not, Oxenford said, "you need to expand those sources."

Renee Licht of the FCC's Mass Media Bureau explained how the FCC evaluates EEO performance when a station has applied for license renewal.

"We review everything on file relating to the performance of the recruitment sources, the number of referrals during the past 12 months, the vacancies and the number of women and minorities hired. We then look for filing of discrimination petitions to deny renewal, the annual statistical filing, whether or not the station has complied with processing guidelines, whether the station has 10 or more employees, and hiring minorities and women with a 50 percent availability."

If stations have been making "a good faith effort" to comply, they should be cleared for renewal, said Licht.

Of sexual harassment, Nancy Wolf, Leventhal Senter & Lerman, said stations should have a policy outlining the commitment to prevent harassment, including a definition, investigation procedures, complaint confidentiality and penalties.

The most common type of sexual harassment is a hostile work environment, where conduct is unwelcome, an employee cannot perform job duties and the complaint is not taken seriously, she said.

— Susan Gary

SATISFY YOUR TASTE FOR THE BEST



Known throughout the world as the best performing, most reliable FM transmitters available, Continental's 816R Series combines superior design and audio quality with exceptional workmanship to give broadcasters an unmatched, field-proven record.

The 816R Series comes in power levels from 10 to 70 kW. Available as an option is an internal control and monitoring unit which tracks trends, stores data and provides an exact visual replica of the transmitter's control panel.

STANDARD FEATURES

- Solid-State IPA
- Internal Harmonic Filter
- Automatic Power Level Control
- Automatic Filament Voltage Regulation
- Exclusive "Soft-Start™" Protection Circuit
- Broadband Quarter Wave Cavity
- Totally Self-Contained In a Single Cabinet

For over 50 years, Continental Electronics has provided excellence in broadcast transmission products worldwide. Refuse to compromise... call Continental first!



Continental Electronics Corporation

P.O. BOX 270879 • DALLAS, TEXAS 75227-0879 • 214-381-7161 • FAX: 214-381-3250

800-733-5011

Visit our web site — <http://www.contelec.com>

9.97.115

Circle (85) On Reader Service Card

World Radio History

If You're Gonna Fight Over Something...



Shouldn't It Be Worth Fighting For?

When you have a point of view you want the public to hear, the last thing you need to worry about is the performance of your phone system.

That's where the Gentner TS612 Broadcast Telephone System comes into the picture. With the TS612, you get a solution that's customized to your needs.

The control surface of the TS612 looks like an everyday phone, but *ordinary it is not!* Any demanding talk show operates seamlessly with the sophisticated features and benefits which include:

- Auto mix-minus
- Multi-colored line indicators that instantly show status of calls
- Use it on/off air at the same time
- Superior audio quality

Operate a 6 to 12 line phone system that has two built-in digital hybrids which allow conferencing of up to four callers on the air. If preferred, Drop-In Panels for your console or TS612 ScreenWair Software can be provided so that your phone system is tailored to your application.

Gentner's TS612 is also ready to grow when you are. The TS612 Network Interface allows you to tie multiple studios together while the Network Tools Software creates expansion of up



Gentner

Gentner's TS612 Multi-Line Broadcast Phone System is the best custom solution that comes as a standard product.

to 120 phone lines in a 10-studio network. You can have studios with dedicated lines while others have common lines.

With all this gear, try out a Router that instantly makes a telephone line change to any studio. For example, you have a national toll-free talk show in the morning in the same studio where you have a

local show in the afternoon. Each requires different phone lines. Get a Router and the change is done in a snap!

When you examine the possibilities, there's no contest when it comes to the best, most complete package at the right price. Gentner's TS612 is the only system worth fighting for. The only thing left for debate is why haven't you ordered yours yet? Well? Oh, Harris is just a call away. Contact your representative today to make your talk show operate easier!

Harris Corporation Broadcast Division

U.S.:
1-800-622-0022
FAX: 765-966-0623

Canada:
1-800-269-6817

<http://www.broadcast.harris.com>

 **HARRIS**

Circle (124) On Reader Service Card

World Radio History

© 1997 Harris Corp.

The World Standard



7 Reasons Managers Prefer Dalet

1. Dalet Is Cost Efficient
Time is money. Dalet's unique design saves your station time. It frees up your people to do more important tasks. It cuts payroll and benefit expenses because you'll need fewer people, and save the time of the people you do have. And it keeps on running, day after day, with virtually no maintenance.

2. Dalet Is Reliable
Because Dalet stays on the forefront of computer technology, you can be sure your station will stay on the air. Dalet was one of the very first providers of digital audio systems. By now, everyone agrees Windows, networks and Digigram cards are the way to go. While other companies are scrambling to redesign their system according to PC industry standards, we've had 7 years to perfect ours. It WORKS!

3. Dalet Provides Custom Solutions
Why should you have to accommodate someone else's design for your radio station?

Solutions in a "box" are an outdated concept. Why pay for features you don't need or won't use? Why accept a system that won't do everything your station needs? Each Dalet installation is fit like a glove to your specific station needs.

4. Dalet Is Flexible To Your Future
Dalet's design allows you to make changes as they are needed. You won't have to worry that a solution you bought today will be put on the shelf a year from now because it can't be adjusted to your new needs.

5. No Planned Obsolescence
Unlike many companies, we don't intend to sell you a unit today, wait for technology to change in a couple of years and try to sell you a whole new system. Our unique architecture is perhaps the only system which can easily change as technology changes. You won't be forced to live in the past just because you bought a system that can't be easily upgraded.

6. Group-Wide Productivity Gains
All your radio stations can pool their resources, whether they're in one building or in different cities: Share production work among stations. Book orders from one station to another. Send journalists on the road, and let them file their reports over the Internet. We aren't just talking about cart replacement here. Reap the benefits of group consolidation with Dalet.

7. Unprecedented Support
While you're sleeping, Dalet's people are working around the clock to assure that your station stays on the air. 24-hour support is available to give your station the service it needs. DALET HAS OVER 70 SUPPORT PEOPLE AND ENGINEERS. Our New York-based support people are always on call when you have a question or need a solution.

Broadcasting Solutions for

- Cart Replacement • Live Assist • Satellite Automation • Multitrack Editing • Music Automation • Text and Audio for News • Traffic • WEB Publishing • Archiving

The World Standard

- Windows 95 or NT • Full Redundancy • Standard PC Networks • ISDN and Internet Transfers • Unlimited Storage/Users • Client Server Architecture • 24 Hour Technical support • Configurable Control Panels

in Digital Audio

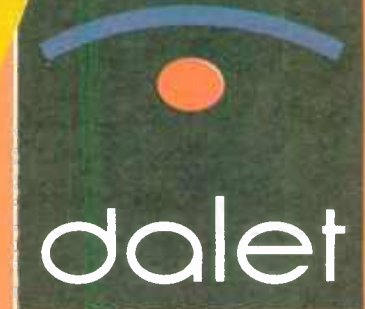


www.digigram.com



Free Demo At Your Office

Call us to set up a date. We'll bring the demo to you or make arrangements for you to visit an installation that best fits your needs.



Call (212) 226-2424
or visit www.dalet.com

Circle (135) On Reader Service Card

World Radio History

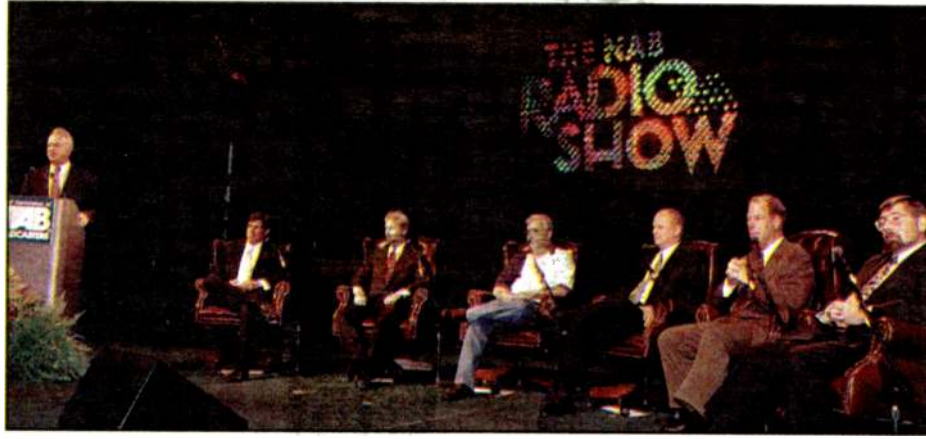
Group Heads See a Time of Flux

by Leslie Stimson

NEW ORLEANS Seven players of the radio industry, group owners, bantered easily with each other about what changes consolidation has brought to station prices, how they run those stations now and what the future holds in a power panel during The NAB Radio Show.

The executives disagreed on whether station prices are too high. Emmis Broadcasting Corp. CEO Jeff Smulyan said, "How can you create value out of these prices? We've seen deals we can't make work."

Evergreen Media Chairman/CEO Scott Ginsburg said, "Those getting out



Radio at the Summit

(of the business) have met their price objectives.

"While prices today may seem high," he said, radio is still priced less than newspapers.

Triathlon Broadcasting President/CEO Norm Feuer predicted prices will continue to rise, while Smulyan was more cautious. "I'm afraid we've oversold this baby," Smulyan said.

Smulyan also told his comrades that radio has to continue to work hard to grow as a business. "Just telling Wal-Mart 'We've consolidated' doesn't get it done," he said. The same principles of selling that applied before consolidation are still necessary in this "new world order."

Along with groups getting fatter and stations creating efficiencies in several departments comes the downside of managers losing their jobs when their station is bought by a larger group. Smulyan cautioned that stations can't just "cut our way to prosperity," while Feuer said general managers looking for work are exploring different options. For example, some general managers who had been running one station in a large market are now running groups in smaller markets.

Jacor Communications CEO Randy Michaels said owners still are learning how to run clusters, which sometimes makes for an "uncomfortable, stressful time."

I'm afraid we've oversold this baby.

— Jeff Smulyan

With that learning curve comes selecting managers with different skills than those of four to five years ago. While product management skills were needed years ago, team-building or coaching skills are valued today, said Capstar Broadcasting Partners President Steve Hicks.

Most of the executives agreed consolidation will continue and move to the smaller markets next. With all that activity here, are any of them looking at more opportunities to own stations overseas?

Smulyan said overseas expansion is logical, as radio becomes privatized in markets previously controlled by Communists. But he called the overseas buying process "tedious, difficult" with lower multiples.

Most of the executives said there's too much activity in the U.S. market to expand to other countries during the next year, but left it open for the future.

The group head session included some of the most powerful men in radio. In the photo above, moderator Herb McCord of Granum Communications introduces his panelists. Seated left to right: Jeff Smulyan of Emmis Broadcasting, Bob Neil of Cox Radio, Randy Michaels of Jacor, Steve Hicks of Capstar Broadcasting Partners, Scott Ginsburg of Chancellor Media and Norm Feuer of Triathlon Broadcasting.

**HOW THE
FOSTEX DAT
RECORDERS
STACK UP.**

Your smartest buy in a basic DAT recorder. A third sampling frequency (32kHz) offers up to 4 hours of extended play. AES/EBU and S/PDIF optical I/Os offer professional interface.

The most affordable timecode capable DAT recorder, bar none. Fully loaded with all options, nothing comes close to the D-15TCR. Chase functions are built in and instant start is available without pre-loading.

Your best value in a studio timecode DAT recorder. It's the third generation machine from the company that first offered a timecode DAT recorder (the Fostex D-20). A workhorse professional DAT recorder.

The pinnacle of sophistication in a timecode DAT recorder. Dedicated softkeys help you breeze thru menu settings and commands. Ease of routine maintenance has made it one of the most reliable DAT recorders in the industry.



Fostex

15131 Blackburn Ave. Norwalk, CA 90650 Voice: (562) 921 1112 Fax (562) 802 1964
Support: 1-800 -9-FOSTEX e-mail: info@fostex.com http://www.fostex.com

Super Managers Talk Shop

How does station consolidation and the emergence of radio super-groups affect the management model? How does it affect engineers?

When faced with the responsibility of running so many stations, managers must re-allocate resources, and the most important resource at any station is its personnel.

In recent, separate interviews with RW reporters, Steve Hicks of Capstar Broadcasting Partners and Scott Ginsburg of Chancellor Media talked about the challenges faced by these new mega-groups.

Steve Hicks

Q: How does the management model change when, all of a sudden, you've got 314 stations to run?

HICKS: That's the biggest question we had to answer when we started upon (an acquisition) strategy: How do you manage a group of assets of that size? The traditional way of having a group CEO with station managers reporting to them, in my opinion, would not work in that environment. So, we came up with the idea of five



Steve Hicks

regional operating companies, which we have now created and formed. We now have a northeastern group, with its own CEO that runs stations in that region, as well as the Southeast, Southwest, West and Midwest.

We think we've come up with an extremely effective way to run a large group of radio stations.

Q: How does the model change for an engineer? Are there more responsibilities placed on the shoulders of one engineer? Will there be a group director of engineering, or regional engineering managers?

HICKS: All of the above.

We're in the process of connecting all of them with a wide area network, an intranet. We're modeling that in GulfStar. We'll have that on-line in the next 60 days, and we hope to do that through all Capstar by this time next year.

We hope to move programming from one market to another, and from hubs that we're creating, into other markets. So we think we're creating a much higher quality programming in these markets.

Engineering is a real key to how that's going to work. Digital automation technology combined with computers and

wide area networks is the whole basis of our strategy.

Q: What do you think the impact of new technologies like DARS and virtual programming is going to be on the industry?

HICKS: Direct satellite will have a place. In the absence of being able to do local programming, I don't think it's going to be a huge force going forward in the industry.

We've actually worked with The Research Group in creating (virtual) programming for a couple of our markets. I think that's a wave of the future in smaller markets.

I think it's going to be much better radio than what's happened in some of these markets where you're having satellite-delivered programming today. If you could have local programming tailored to that market delivered in this fashion, I think it's going to be a much better product than what you've seen in the past.

Scott Ginsburg

Q: With the new Chancellor coming on, how does being in a large group affect the chief engineer's job?

GINSBURG: I don't know that we have a chief engineer. We have a lot of very

good engineers that work their own marketplaces, by and large. Sometimes they will be called in on a moment's notice to come help us on a project where appropriate, but I don't think there are any particular changes. I don't think there is any huge change now that they are working for Chancellor Media.

Q: So you don't necessarily have a chief engineer at each station, but maybe one engineer who services all the stations in that area?

GINSBURG: No, we have not taken an approach to this business of "Let's figure out a way to cut all the costs and go from 3-inch mirrors to 1-inch mirrors" or "from four secretaries to two secretaries." This is a top line-oriented company, where we believe our job is to grow the top line and keep the expenses in check. In the process of keeping expenses in check, this does not include dismissing employees.

Q: Then how do engineers fit into your management model?

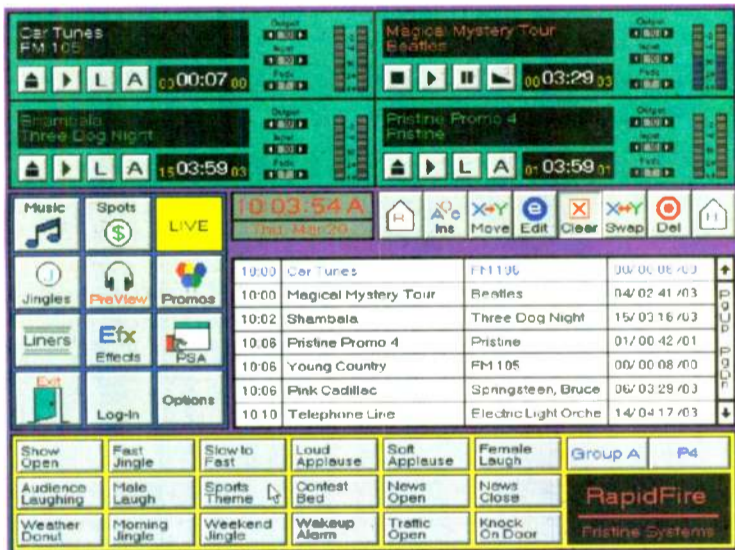
GINSBURG: The engineers have an important role in each of the radio stations, but we have not taken a situation and made one of the radio stations more important than another. Occasionally, they will pick up a second or third assignment but we haven't turned the stations over to any one engineer.



Scott Ginsburg

Pristine RAPIDFIRE "...it's fun to use!"

Satisfaction Guaranteed!



Pristine RapidFire is the industry's most powerful, fun to use, Digital Studio System! RapidFire will save you thousands of dollars over other high-end digital systems, while offering superior features and bulletproof reliability. RapidFire's *Quick Picks* make it easy to add or change music, commercials, promos, and last minute insertions simply by *point and shoot*. RapidFire masters live assist, walkaway, and satellite operations. Playback three audio sources simultaneously while recording a phone bit or timeshifting a network feed. Call us to find out how easy and affordable it is to harness the power of Pristine RapidFire for your station!

"Pristine RapidFire is great, it's fun to use! It's got everything a station would want in a digital system. We use RapidFire in both Live Assist and Auto modes, all day long and it never gives us any trouble."

Matt Sedota, WNMB, North Myrtle Beach, SC

The Next Generation in Broadcast Software

West & International
310-670-7500
Fax 310-670-0133

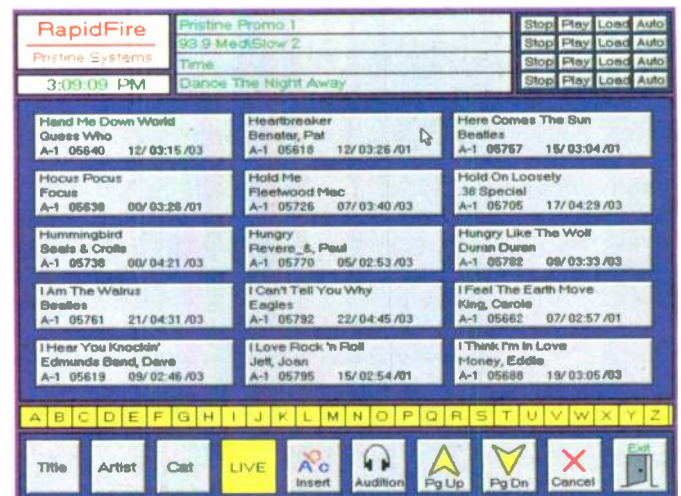


East
864-292-0300
Fax 864-292-9030

<http://www.pristinesys.com>

EAS COMPATIBLE

TECHNICAL SUPPORT
24 Hours



Quick Pick Screen

Automakers Drive RDS On

► RDS, continued from page 1

Pocono Mountains, do use the alternate frequency feature to link their repeaters automatically. However, on this side of the Atlantic, RDS is most commonly used for text transmission.

Why include RDS technology now? Because the technology is "fairly well established" in Europe and "very functional," said a Jaguar spokeswoman. It made sense for Jaguar to incorporate RDS, she said, because the company builds automobiles for a world market. If enough manufacturers start equipping the cars, maybe broadcasters will use it more, she said.

About 700 U.S. broadcasters are using

RDS, said Lisa Fasold of the Consumer Electronics Manufacturers Association (CEMA). CEMA initiated a program two years ago designed to get stations in the top 25 markets up and running with RDS. About 300 signed up, said Fasold.

The Jaguar spokeswoman said she was "pleasantly surprised" when she tested the Jaguar receiver in the New York City area and found many stations displaying their call letters. Being new in town, she said, it helped her to see the call letters.

Cadillac was the first domestic automaker to announce it would offer RDS in its 1998 models. Delco is the original equipment manufacturer (OEM) of radio receivers for Cadillac. Scott

Wright, a project engineer for audio systems at GM Delco Electronics, is a proponent of RDS and has worked to establish a compatible RDS standard between the United States and Europe.

While the lowest cost Jaguar model, the XJ-8, starts at \$54,750, there are other more affordable RDS possibilities. Ford will offer the RDS radio as an option in nine of its models including the Ford Explorer, Ford



A Close-Up of the RDS Radio Offered by Jaguar

Ranger and Ford Econoline vans.

"The CE manufacturers have made a major move here," said Wright. He likened the back and forth between receiver manufacturers and broadcasters to a dance. When 300 broadcasters came on line with the CEMA program, the automobile manufacturers responded by introducing RDS radios. If broadcasters who have RDS capability start to use it and another 10 percent add RDS capability, Wright predicted CE manufacturers would respond again.

Opinions on the success of the CEMA campaign vary. But Wright said it definitely was successful in that it convinced receiver manufacturers that there were enough stations using RDS in major markets to build RDS receivers.

But making sure consumers could find those receivers in stores was an early concern of stations, who felt the RDS receivers were hard to find.

Russ Johnston, vice president of product planning for Pioneer, said his company has produced six new RDS products for the car since January. The chain Best Buy is handling two of the six models.

"To the industry and the RDS community, I think this is a really big announcement," said Johnston of the auto makers' plans.

He said he expects more RDS products to be announced at the 1998 Winter Consumer Electronics Show now that companies like Pioneer, Denon and Kenwood have incorporated RDS.

Denon, which introduced the first RDS car receiver in North America, has six RDS receivers just for the mobile environment and more for home use.

Mike Gatta, car audio sales manager for Denon, also believed the announcement by the car manufacturers would get more broadcasters interested in the technology.

Fasold said she thinks station interest will depend on the marketing that car manufacturers do. If Cadillac pushes RDS in its radio ads, Fasold said, it is likely to expect the stations to be using RDS.

RDS can be used to tune by program type like jazz or country. It can also transmit various text like the name of the station or program or song and artist currently playing.

Fasold said the biggest thing the car manufacturers decision has meant for RDS is that the technology is getting more coverage from the consumer media.

The New York Times ran an article shortly after the Cadillac announcement that generated interest among other car manufacturers and prompted some to make announcements of their own.

Who has the best Digital System for groups?

CapStar/GulfStar

- Austin, TX
- Baton Rouge, LA
- WJBO-AM
- WLSS-FM
- WYNK-AM
- WYNK-FM
- KRVE-FM
- WBIJ-AM
- Beaumont, TX
- KKMY-FM
- KLVI-AM
- KYKR-FM
- KTCC-FM
- Corpus Christi, TX
- KMXR-FM
- KRYS-AM
- KRYS-FM
- Fayetteville, AR
- KKIX-FM
- KKZQ-FM
- KEZA-FM
- Fort Smith, AR
- KMAG-FM
- KWHN-AM
- KZBB

- Killeen, TX
- KIIZ-FM
- KLFX-FM
- Lawton, OK
- KLAW
- KZCD
- Longview, TX
- KKTX
- KNUE
- KNUE
- KISX
- KTYL
- Lubbock, TX
- KFMX-FM
- KKAM-AM
- KRLB-FM
- KZII-FM
- KFYO-AM
- KKCL
- Lufkin, TX
- KYKS-FM
- KAFX-FM
- Shreveport
- KRMD-AM
- KRMD-FM

- Texarkana, AR
- KKYR-AM
- KKYR-FM
- KLLI-FM
- KYGL-FM
- Tyler, TX
- KNUE-FM
- KISX-FM
- KTYL-FM
- KKTX-AM
- KKTX-FM
- Victoria, TX
- KIXS-FM
- KLUB-FM
- Waco, TX
- KBRO-FM
- KCKR-FM
- KKTK-AM
- WACO-FM
- KWTX-AM
- KWTX-FM

CapStar/SouthernStar

- Cocoa, FL
- WLRQ-FM
- WMYM-AM
- Decatur, AL
- WTAK
- WWXQ-FM
- WDRM
- WBHP
- WHOS
- Tuscaloosa, AL
- WACT-AM
- WTXT-FM
- WRTR-FM
- WZBQ-FM

CapStar/PacificStar

- Modesto, CA
- KVFX
- Yuma, AZ
- KTTI-FM
- KBLU-AM
- Cocoa, FL
- WLRQ-FM
- WMYM-AM
- Decatur, AL
- WTAK
- WWXQ-FM
- WDRM
- WBHP
- WHOS
- Tuscaloosa, AL
- WACT-AM
- WTXT-FM
- WRTR-FM
- WZBQ-FM

CapStar/AtlanticStar

- Dover, DE
- WSRV
- WDOV
- Wilmington, DE
- WJBR-AM
- WJBR-FM
- WDSO
- Winchester, VA
- WFQX
- WUSQ
- WNTW

Triathalon

- Colorado Springs, CO
- KSPZ-FM
- KVUU-FM
- KVOR-AM
- KTWK-AM
- Kennewick, WA
- KTOR-AM
- KLOK-FM
- KNLT-FM
- KEGX-FM
- KKNX
- Lincoln, NE
- KZKX
- KTGL
- Omaha, NE
- KTNP-FM
- KXKT-FM
- Spokane, WA
- KEYF-AM
- KEYF-FM
- KKZX-FM
- KUDY
- Wichita, KS
- KOAM
- KEYN-FM
- KFH-AM
- KRBB
- KWSJ
- Drake Communications
- Rogers, AR
- KLTG-AM
- KWMO-FM
- Tahlequah, OK
- KTLO
- KEOK

Lazer Broadcasting

- Big Bear City, CA
- KXSB
- Hemet, CA
- KSDT-AM
- KXRS-FM
- Oxnard, CA
- KXSP
- KXLM

Noalmark Broadcasting

- El Dorado, AR
- KIXB-FM
- KAGL-FM
- KELD-AM
- Hobbs, NM
- KYKK
- KZOR
- KIXN

NPR Affiliate

- Boise, ID
- KBSW-FM
- KBSX-FM
- KBSU-AM
- Hutchinson, KS
- KHCC-FM
- KHCD-FM
- KHCT-FM

Jacor

- Iowa City, IA
- KXIC-AM
- KKRQ-FM

Salem

- Boston, MA
- WPZE

Denver, CO

- KRKS-AM
- KNUS-AM
- KRKS-FM

Los Angeles, CA

- KKLA
- KLTX

Houston, TX

- KKHT

Minneapolis, MN

- KKMS
- KEGE

New York, NJ

- WMCA
- WWDJ

Phoenix, AZ

- KPXQ

Sacramento, CA

- KFIA
- KMJI

Faith

- Communications
- Las Vegas, NV
- KILA-FM
- Ogden, UT
- KANN-AM
- Twin Falls, ID
- KCIR

Warner Enterprises

- Canon City, CO
- KRLN-AM
- KSTY-FM
- Lincoln, NE
- KLIN-FM
- KEZG-FM
- KFEG-FM
- KKUL-FM

Bloomberg L.P.

- Boston, MA
- WADN-AM
- Norfolk, VA
- WVNS
- Phoenix, AZ
- KFNN-AM
- Portland, OR
- KBNP-AM
- Providence, RI
- WPNW
- WKIX
- Seattle, WA
- KEZX-AM
- KWJZ-FM
- St. Louis, IL
- WINU-AM

Cromwell Group

- Nashville, TN
- WCTZ-AM
- WQZQ-FM
- WZPC-FM

Catholic Broadcasting

- Nome, AK
- KNOM-AM
- Portland, OR
- KBVM



Kevin Lockhart
President, Prophet Systems

'NUFF Said!
...just ask any of our groups!

Prophet Systems, Inc.

Sales: (800) 658-4403
Support: (308) 284-8450

Sales & Support Fax: (308) 284-4181
E-mail: sales@prophetsys.com

Nets Scrambled as World Mourned

by James Careless

WASHINGTON The death of Princess Diana was an unexpected and gripping tragedy, the news of which dropped on U.S. radio listeners in the midst of the Labor Day weekend. But for radio networks, it was perhaps the spot news story of the decade.

As with most spot news, the story began quietly enough. "Shortly before 8 p.m. Eastern we received guidance that Diana had been in a car crash," said Charles Kaye, executive producer for radio at CBS news, who was the manager on call that night.

At first it seemed that Diana had escaped with minor injuries; within a few hours the truth leaked out.

"We received not-for-broadcast guidance from well-placed sources that Diana was dead shortly before 11:30 p.m. Eastern," Kaye recalled. "We then confirmed that, and took air with a CBS News Net Alert Special Report at 11:44 p.m. Eastern announcing the death."

Other radio news organizations found themselves in similar circumstances, and threw themselves into action. Like CBS, ABC News first alerted its people in Paris and London. Bernard Gershon, vice president of ABC News Radio, said ABC then sent out correspondent Jim Burns "on the first Concorde out of JFK. ... He was there in three-and-a-half hours."

UPI also acted quickly, deciding which of its U.S. staff to send to the scene. UPI coverage was bolstered by the existence of the company's wire service.

"There was a quick check to see who had a valid passport among our producers," UPI Assistant General Manager Tom Gauger said. As it turned out, producer Jim Burns was one of those who did, so he was shipped out by plane to London. AP was somewhat more fortunate, with Chris Burns in Paris and Karen Sloan in London, both of whom were on-air by 8:10 p.m. Within a number of hours, the center of the action, as far as network personnel was concerned, shifted to Europe. Thus began Phase Two of the Princess Diana story: on-the-scene reporting that dominated the airwaves for the next week.

With bureaus in London and New York, CBS Radio was well-equipped to deal with the story. "Fortunately we have a full-time radio satellite from London to New York as well as a backup ISDN circuit," Kaye said, "and a full-time ISDN circuit from Paris to New York."

The CBS bureau is located just minutes away from both the accident site and the hospital where Diana was taken. This allowed Paris correspondent Elaine Cobbe to take short breaks from her on-air duties, so that she could go back to the sites from time to time for more information and color.

ABC staff also worked out of bureaus in Paris and London. A unique twist was its use of an Inmarsat B satellite terminal in London. This portable unit "has a high-speed data application, so you can use ISDN on the Inmarsat B terminal, which gives you studio-quality audio," Gershon said. "Basically anywhere you have a power source — even a thousand-watt generator or something comparable, or a car battery — you can use this to get high-quality audio."

This capability proved crucial for ABC News, he said, "because it took about a

day for British Telecom to put ISDN out in the streets."

Gershon said his staff also used a single-line POTS codec to send digitized audio over regular phone lines. "They sound not as good as ISDN, but they sound pretty damned good, and they're pretty reliable even on overseas calls," he said.

Meanwhile, UPI's Jim Burns set up shop at Feature Story, one of UPI's clients in London. Using a portable DAT machine, he gathered audio for other UPI

Westminster Abbey as its anchor location, and sent reporters to various locations to gather "streeters" from the crowd.

ABC anchored its coverage from a venue overlooking Westminster Abbey. It too dispatched reporters into the crowd at various locations.

Meanwhile, for AP All News Radio, "Mark Smith anchored our funeral coverage from our London bureau," said Ed Tobias, APR's assistant managing edi-



ABC Radio News Correspondent Tim Scheld reported on the emotional response of the British people at Buckingham Palace to Princess Diana's funeral.

correspondents, as well as voice reports for the network. UPI, too, relied on ISDN to get its audio across the Atlantic.

Multiple bases

Intensive coverage continued on all media, as listeners and TV viewers around the world anticipated Diana's funeral on Saturday, Sept. 6. For its funeral coverage, CBS had an advantage: its London bureau overlooks Hyde Park, where many of the mourners were watching the funeral service on large-screen TVs. The network also rented a pub near

tor/news, with other correspondents located at Westminster Abbey, Windsor castle, and Kensington Palace. "We used ISDN dropped at those locations and, in some cases, cellular phone."

UPI also did something different: instead of duplicating the coverage being generated by its rivals, the network instead simulcast the BBC Home Service's funeral coverage. By doing so, its managers said, UPI offered a real alternative, one that offered Americans a unique perspective on the event.

"The BBC did their usual incredible

job, which no one else can touch, of painting word pictures," Gauger said. "I mean, you can just see it: 'measured footsteps on the street.' It was just the sort of thing you really do want to hear."

What lessons does the event hold for radio network news managers?

First is the importance of ISDN telephone connections for spot news coverage. The audio quality offered by ISDN made radio coverage come alive.

The second lesson is the importance of having equipment prepared and ready to go. For instance, as a result of ABC's experiences with the Inmarsat terminal, "We're going to make sure that we now travel with basically a couple of hundred feet of extension cable, so that we can throw an antenna up on a roof, and leave the actual transmission device in a hotel room somewhere," Gershon said. "Because (if) you show up in India, and it's monsoon season, you don't want to have the whole box outside."

In addition, ABC now plans to "build kits that we can put into packing cases, and throw onto planes," Gershon said. These will include a small TV monitor, a portable intercom head, a MiniDisc recorder/player for editing audio in the field, and a laptop.

The third is to make sure to have staff in place, and that all employees who might have to go out of country at a moment's notice have their passports updated and available.



Problem: I have a duopoly. I need back-up transmitters for my stations:



Solution:
Don't buy two -- buy ONE!

Our Legend Series, Solid State, FM transmitters are **Frequency Agile and Broadband**. Your engineer can instantly tune one to any frequency!

We've designed the Legend Series to ensure long transistors life with "wind tunnel" cooling & brute force power supplies.

Legend transmitters make great main transmitters too!
Available from 1KW - 11KW



**Great Products
Great Solutions!**

"The Transmitter People"



BROADCAST EQUIPMENT CO., INC.
PO BOX 801 ♦ 1306 RIVER ST.
Valatie, NY 12184
Phone 518-758-1690 ♦ Fax 518-758-1476
energy-onix @ energy-onix.com

Issues, Insights and Ideas for Your Listener

All Comerical Time Within Program.
Available for Station Sale, No Cash Payments.
Billboard only for Sponsor, Fidelity Brokerage Services, Inc.

For information and a free demo tape contact:
David West at:
Dick Brescia Associates (201) 385-6566
dba syndicators@prodigy.net

SFX/AudioNet Deal Boosts Webcasting

by Frank Beacham

NEW YORK SFX Broadcasting Inc. entered into an exclusive deal with AudioNet to deliver the program feeds of 71 of its radio stations over the Internet. The pact is the largest single Internet-radio station deal to date.

At press time, 10 SFX station feeds already were being carried live by AudioNet, the largest aggregator of radio stations on the Internet, at <http://www.audionet.com/radio>

The remaining stations, said SFX executives, gradually will be launched throughout the remainder of this year, with all stations online by the first quarter of 1998.

The deal, said AudioNet President Mark Cuban, will boost his company Internet station offerings to 270. It also will significantly contribute to the explosion of radio webcasters, a number that has increased an estimated 1,100 percent from this time a year ago.

According to figures provided by Intervox Communications, a Washington-based webcasting consultancy, there were 703 audio broadcasters on the Internet worldwide as of September. Of those audio broadcasters, 398 were U.S. radio stations, 215 international stations, 27 networks and 63 Internet-only outlets.

The SFX agreement, said Cuban, is a barter deal in which SFX provides the

station program feeds and AudioNet provides its network, servers, software and distribution services. As with most of its deals, AudioNet will receive air time on SFX stations it can resell.

Mike Ferrel, SFX president and CEO, said he feels it is important for radio stations to deliver their programming over the Internet because "I believe the PC will become the in-office radio receiver of tomorrow." He declined, however, to predict when that might happen.

"I want to be proactive as a broadcaster," he said. "I want to make our radio stations as available as possible to the listening public. I believe it is an intelligent and timely strategic step for SFX to affiliate with AudioNet."

The deal is also a boost for Microsoft's new NetShow audio streaming technology, which AudioNet will use to deliver the SFX station feeds to computer desktops. Currently, the Progressive Networks RealAudio dominates the Internet audio market with nearly 88 percent of the broadcasters using its streaming technology. Prior to the SFX deal, NetShow had only 3.6 percent of the market.

Throughout the past summer, however, Microsoft engaged in a string of deals with various streaming media companies in order to gain a stronger foothold in the market. Among those deals was a licensing arrangement with its key competitor, Progressive Networks.

"The Microsoft deals have made life easier in some respects but not in others," said Cuban. "For the listener, systems will become more compatible. But in terms of technology choices from the server perspective, they (Microsoft and Progressive) are still arch enemies ... death knell competitors."

The upcoming release of Microsoft's new Internet Explorer 4.0 browser will ease webcast reception for computer users, said Peggy Miles, president of Intervox Communications.

The number of radio webcasters has increased an estimated 1,100 percent from this time a year ago.

"Part of the problem is that users now have to be technically adept to figure out how to receive webcasts," Miles said. "With Microsoft putting webcast receiving capability into their new browser, users will no longer have to download special software. This will greatly simplify the process and increase the listenership of radio stations on the Internet."

Another factor expected to increase audience size on the Net is the rapid emergence of multicasting capability. With multicasting technology, broadcasters can have a large number of listeners simultaneously rather than be limited by a fixed number of audio program "streams," which can be accessed by only one listener at a time.

"We are multicasting to about 250,000 dial-up ports right now," said Cuban. "We think by this time next year we'll be past a million." Yet, Cuban hedges when asked what constitutes a real mass audience. "I won't be the judge of that," he said. "I'm just going to raise the bar everyday."

"But," he continued, "I will tell you I don't think it's a question of a mass audience, but of which audience. Right now, AudioNet delivers more people in office buildings — more white collar workers between 9 a.m. and 5 p.m. — than any radio station has ever been able to do on their own."

Streaming media technology is especially popular in office environments because business locations tend to have high-speed, high-bandwidth direct computer connections to the Internet, while home environments tend to have much slower 28.8 and 14.4 baud modem connections over dial-up phone lines.

As for the prospects of continued growth of radio broadcasting on the Internet, Cuban said stay tuned for much more activity.

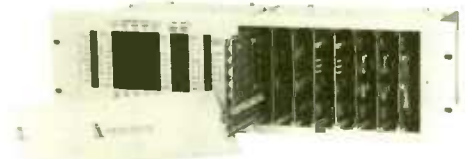
"We will have even bigger deals (than SFX) coming up. Very soon."

25 Years Strong!

Inovonics continues to meet the everyday needs of broadcasters the world over with sensible, top-quality audio-broadcasting products at down-to-earth prices.

222 - Asymmetrical AM Processor

Low-cost Compressor/Limiter/Filter assures NRSC compliance. Also available in several versions for international short-wave service.



250 - Programmable 5-band Stereo Processor

Gated AGC, 5-band Compression and EQ, split-spectrum Limiting—all with colorless, quasi-digital PWM gain control. Manually pre-program several processing presets or place the unit entirely under RS-232 control.



255 - "Spectral-Loading" FM Processor

A very aggressive Triband-PWM Stereo Processor tailored for contemporary music formats. Broad parameter control over the gated AGC and 3-band Compressor/Limiter.



260 - FM/TV "Utility" Processor

Stereo "gain-riding" AGC and a split-spectrum Compressor/Limiter control average and peak levels. Ideal for TV-aural and budget FMs.



716 - "DAVID-II" FM Processor / Stereo Gen

A tight, smooth AGC/Compressor/Limiter coupled with clean Digital Synthesis of the multiplex baseband signal. Also features internal RDS/SCA combining and a built-in Composite Processor. Outstanding, affordable performance has made "DAVID-II" a popular and legendary product.



708 - Digital Synthesis Stereo Generator

A basic Stereo-Gen with impeccable specifications. Includes front-panel metering, internal subcarrier combining and a built-in Composite Processor.



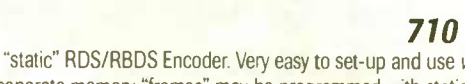
530 - Off-Air FM Modulation Monitor

Accurate, easy-to-read display shows total modulation, pilot injection, stereo separation and crosstalk. RF signal strength and multipath distortion. Alarm outputs for overmodulation, carrier and program audio loss. Eight station presets facilitate quick modulation comparisons.



630 - FM "Relay" Receiver

A professional receiver for translator (re-broadcast) and other demanding off-air pickups. Features composite, MPX and balanced stereo program outputs, synthesized tuning, selectable bandwidth, metering, alarms and remote control.



710 - RDS Encoder

A PROM-based "static" RDS/RBDS Encoder. Very easy to set-up and use without the need for a host computer! 15 separate memory "frames" may be programmed with station and program ID codes, service flags and radiotext messages. May also be used with a PC for song titles, promos, etc.



510 - RDS Decoder/Reader

Use with any mod-monitor to decode and display all RDS/RBDS data groups, and to measure subcarrier injection level with digital precision. An RS-232 interface allows data archiving and analysis.



Coming Soon:

A Subcarrier Monitor for accurate measurement of SCA, RDS and high-speed data subcarrier injection and SCA deviation. Also: a new AM Processor with innovative features, and a "dirt-cheap" RDS Encoder that no station can afford *not* to be without.

Inovonics, Inc.

1305 Fair Avenue • Santa Cruz, CA 95060
Tel: (408) 458-0552 • Fax: (408) 458-0554

www.inovon.com



Running Radio



**A Whale of
A Station
See Page 29**

Radio World

Resource for Business, Programming & Sales

October 15, 1997

PROMO POWER

Plan Now For Happy Holidays

Mark Lapidus

When selecting activities and contests for Thanksgiving and Christmas, I feel like a 20-something-year-old promotion director again. I want to do *this!* No, I want to do *that!* There are so many promotions to choose from, my head spins with the opportunities. Here is my annual gift to you, a short list of seasonal chestnuts that only need a local spin for guaranteed success.

Drum Stick Auction: Obtain at least a half-dozen drum sticks from famous drummers in your format. Auction them on the morning show the week prior to the holiday. Give the proceeds to a charity that feeds the homeless on Thanksgiving.

Give the boss the bird! Listeners call in to explain why their boss deserves a turkey. The best boss gets the bird. So does the listener.

Turkey bowling: Frozen turkeys, pins and a supermarket aisle. The only things you need are prizes. Having a few local celebrities tossing birds adds to the fun.

Jingle Bell Run: The Arthritis Foundation does this in many cities. It's a regular 10K race, except participants run with bells on their shoes and bright red Santa hats above their rosy cheeks. I say rosy because it's cold outside!

If you are reading this article on the beach in a year-round warm climate, have participants run in bathing suits along with the hats and bells.

Christmas Wish: Hook up with an agency that places children in local

See HOLIDAYS, page 22 ▶

Quarter Ends With CBS Bang

Lynn Meadows

More stunning sales announcements highlighted the third quarter of 1997, as they have marked every quarter since the passage of the Telecommunications Act in February 1996.

American Radio Systems (NYSE: AFM), Paxson Communications (ASE: PXN), Katz Media Group (AMEX:KTZ) and SFX Broadcasting (NASDAQ:SFX-BA) were four industry giants that fell to consolidation this quarter.

Not including Katz, the summer deals are valued at nearly \$4.5 billion dollars. Clear Channel Communications (NYSE: CCU) agreed to pay \$600 million for the 46-station Paxson group. Hicks, Muse, Tate & Furst Inc. and Capstar Broadcasting Partners will pay approximately \$1.2 billion for the 70-plus stations owned by SFX.

But the late-quarter finale came from Westinghouse, which announced it would purchase the 98 stations owned by ARS for \$1.6 billion and the assumption of approximately \$1 billion of debt. Who could have imagined such numbers just two summers ago when the National Association of Broadcasters was struggling to convince Congress to lift the 20 AM and 20 FM ownership caps?

"The biggest trend is that some of the consolidators have started to sell," said Steven Pruett, senior vice president of the New York-based investment bankers Communications Equity Associates. "The consolidators are beginning to consolidate one another."

Set in motion

Broker Richard Blackburn of Blackburn & Associates called this trend "super consolidation." He said the agreement between Paxson and Clear Channel was significant this quarter because it marks the exit of one of the "early believers" in radio and may have put in motion other deals. Although the initial announcement of the Paxson sale came at the end of June, the definitive agreement was signed in late August.

Paxson and SFX will stay in business but pursue non-radio interests. Chairman and CEO Lowell "Bud" Paxson said his company will use the capital from its radio sale to venture further into television station ownership. Robert F.X. Sillerman, executive chairman of SFX, said he will launch SFX Entertainment, a concert and entertainment business, which will work with 20 concert venues in five states.

Research, said that when "savvy operators" like Paxson and Steve Dodge, president and CEO of ARS, are seen "heading for the exits," the industry "may be at a pricing peak."

Lack of commitment

Another industry observer who asked not to be identified said that ARS and SFX appeared to be the least strong of the top radio groups; he said the manage-

Below are the stock prices for the top 10 radio owners (based on estimated 1996 revenues), showing the price at the beginning of the third quarter and ending on Sept. 23. The group rankings are provided by BIA; stock prices are from other resources.

Group	July 1	Sept. 23
CBS	23 1/8	27 5/16
Chancellor Media	—	47 1/4
— Evergreen	44 5/8	—
— Chancellor	40	—
Capstar	(not publicly traded)	(not publicly traded)
Jacor	38 1/4	45 1/2
Clear Channel	61 1/2	64 13/16
ABC (Disney)	78 7/8	79
Cox Radio	25 5/8	29 3/4
Emmis	43 5/8	47 3/4
Heftel	55 1/4	76 3/4
Sinclair Communications, Inc.	30 7/8	38 1/2

"In the consolidating radio broadcasting industry, much as we believe in its continued status as a very attractive business and in its prospects, the premiums being placed upon companies such as SFX have led us to respond to the flurry of acquisition offers which we have received," Sillerman stated in a press release.

Peter Bowman, vice president of BIA

ment infrastructure was not seen as being as solid or as committed to radio as that of the other mega-groups. Holding on another year or two, he said, would have opened Dodge and Sillerman to the risk of falling prices.

Bowman said the third-quarter activity signaled that consolidation is accelerating. Before, groups of 200 or 300 stations

See QUARTER, page 23 ▶

RADIO BUMPERS

Y-107, KLYY(FM), in Arcadia, Calif., goes for a well-rounded look to promote its modern rock format. No corners or right angles in this station



logo, just around the edges of the bumper sticker itself.

We ran a photo of this bumper sticker in an earlier issue, but the logo did not print clearly in some copies.

How does your bumper sticker get your station message across? Send it to RW Bumper Sticker, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041.

Out of the Comic Strips... Onto the Airwaves...



Superman • Batman & Robin • Tarzan • Dick Tracy
The Lone Ranger and MANY, MANY more!!!

Thirty-Minute Format • Weekly • Barter

For More Information and a CD Demo, Contact
DAVID P. WEST AT 1-201-385-6566.

e-mail: dbasyndicators@prodigy.com

Another Fine Radio Program From Dick Brescia Associates

Circle (196) On Reader Service Card

COLE'S LAW

Lines: To Cross or Not to Cross?

Harry Cole

There are lines everywhere. We don't necessarily see them, and we may not even be aware of them. When we drive from home to work, we go across a city line, or a county line. We cross school zone lines, and political subdivision lines.

This applies to how we conduct our daily affairs, too. As citizens, we are obligated to stay within the confines of laws. As participants in the regulated industry of broadcasting, we are also obligated to stay within the lines set up by FCC rules and policies, even if those lines are different than those that apply to non-FCC conduct.

And then there are less definite lines, such as the lines of libel and slander. It is not a crime to libel or slander someone, and the FCC won't care either, as far as your broadcast license is concerned. But if the subject of your remarks feels sufficiently aggrieved and is able to convince a judge or jury that you crossed the line into actionable defamation, you will be held liable.

But defamation lines can be blurry before the fact. They gain absolute definition only after, when a lawsuit is brought and the matter resolved in the courts.

Even less definite lines involve personal values, like morals, ethics and taste. And those are the ones that make life complicated for managers of radio stations.

Real world case

These questions of lines and limits popped up when our editors called our attention to an incident in Colorado in July. According to published reports, a 36-year-old man suffered an epileptic seizure and drowned in front of his children, ages 6 and 4. The children tried to revive him, but couldn't do it. Commenting on this tragic incident, a morning radio show suggested that the

kids could have made a "seizure salad" after their father died.

In the wake of the broadcast, the dead man's family, apparently outraged by the remark, considered legal action. The morning show's personalities were suspended for three days. The station planned to dedicate a 15-minute "issues" program to epilepsy.

Obviously, the jocks crossed some lines in their comments.

The lines did not involve criminal law, as far as we can tell. The lines did not involve FCC regulations, either. As a general rule, the commission does not involve itself in specific programming content, except in certain narrow areas, such as obscenity, indecency and certain aspects of political programming. So the station's license is safe from FCC reaction.

The lines probably did not involve libel or slander. The particular standards for defamation are determined on a state-by-state basis, so it's not easy to know, as we sit here in the Cole's Law Compound overlooking the Potomac River, exactly what a Colorado court might find to be defamatory. But generally, a defamatory remark has to call into question the honesty, integrity or like qualities of an identifiable individual or group. Here, the reference to "seizure salad" doesn't appear to go that far.

Did the remark cross any lines that could result in liability? That's hard to say. To the extent that the courts may, in some sense, act as a social conscience, it is possible that a lawyer would come up with an approach that would get such a matter before a judge or jury. So we would not discount the possibility of a valid lawsuit being brought in such a case. Whether it would be successful is another story, but the hassle, expense and distraction of litigation are major headaches in themselves, without regard to the potential of substantial liability if

the plaintiff makes the charges stick. Radio managers should keep these considerations in mind when setting their own on-air boundaries.

Downside

Beyond these potential risks, such remarks carry with them more subtle costs. The jocks themselves were suspended. The station, obviously embarrassed by the publicity, publicly expressed regret, and tried some measure of atonement by providing a 15-minute show on epilepsy.

And the industry itself may suffer — maybe not from this single incident but from the accumulation of such incidents. It's not too much to believe that the credibility of the radio industry shrinks in the public's estimation each time a jock goes well beyond the lines of good taste and judgment. If public sentiment rises up in reaction to repeated lapses, the worst-case scenario could be the enactment of

legislation codifying some standard of good taste.

Yes, we know the First Amendment should, in a perfect world, provide a shield against such legislation. But we don't live in a perfect world. The FCC can already take punitive action against the broadcast of "indecent" material, even though the precise definition of "indecent" is muddy and, in application, often reduced to a question of "taste." Also, if you think the First Amendment is a total shield, talk to a tobacco company that might like to advertise its cigarettes on your station.

As we go about our day-to-day business, be aware of where the lines are, and be sensitive to what may happen — to ourselves, to others, to the industry — if we cross them.

If you have any questions about this, you should contact your communications counsel.

■ ■ ■

Harry Cole is a principal in the Washington-based law firm of Bechtel & Cole, Chartered. He can be reached at (202) 833-4190 or on the Internet at coleslaw@erols.com.

Try Out Some New Seasonal Promotions

► HOLIDAYS, continued from page 21
foster homes. You're going to interview these kids to find out what presents they'd like for the holidays. You then air the calls of the people phoning to grant the wish, thanking them for their generosity.

There are two methods of gift collection: Have listeners bring them by your station, or have them drop by a check or credit card number with the amount of they wish to spend, and you buy the present. It's nice to have a wrap-up party at a child-friendly restaurant where kids get to meet the folks who made the donation. Be sure to have lots of sweets, a Santa and games.

Carefully work in a client this way: "W - - - Christmas Wish is presented in part with a grant from (Sponsor)."

Twelve Days of Christmas: Each day give away a different (and hopefully larger) gift on-air. Have people register at a sponsor location and by phoning or faxing the station. Announce a name at a selected time. You must be listening to win. The grand-prize winner could win all 12 gifts. Ask clients to throw in the gifts with the schedule.

Food Drive: There are lots of ways to tackle this.

In many markets, the Boy Scouts collect food from Thanksgiving to the first week in December. Tie in with the largest grocery chain. The Scouts drop off plastic collection bags at the door in your hottest ZIP codes. One week later they come back and pick 'em up, taking all the food to a central location where you are doing a live broadcast. Put a sponsor on the bag, on the air and in any print ads you develop.

Have a DJ do an on-air marathon from inside a huge box in a mall or store, or from a truck. The jock stays until the area is filled with food. Very important: The first year you do this, have a back-up plan where you're able to bring in a lot of the food yourself.

Create a "Canned Film Festival" at a local multiplex. Listeners pay a reduced amount to get in and drop off cans of food.

Cruisin' Christmas: What do a lot of people do just prior to Christmas? Drive! Make it easy for them with a gift they'll remember you for — free gas, plus state road maps customized with your call letters. Both presents can be sponsored.

Charge It for Christmas: On Christmas Day give away massive quantities of batteries on-air. Make sure kids have what they need after they get the gift.

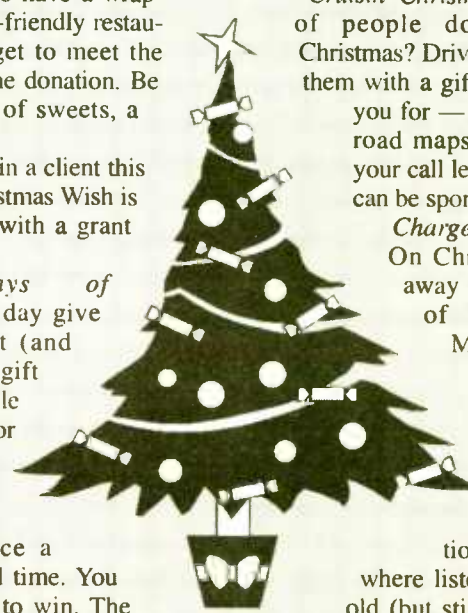
Gloves for the Homeless: Set up locations at client offices where listeners can drop off old (but still useable) gloves. This can also be done with coats.

Naughty & Nice: Works best for blue morning shows. Using highly descriptive verbiage, the morning show gives away hard-core lingerie to callers who describe the nice things they've done that should entitle them to something naughty.

So go for it. Make the fourth quarter what it should be: fun and profitable!

■ ■ ■

Did your station run a promotion based on an idea in *Promo Power*? Tell us how you did. Drop a note to Mark Lapidus at lapidus@erols.com



Now Radio Listeners Can

"Watch"

Their All-Time Favorite
Hollywood Stars and Movies

On...

CLASSIC MOVIE CLASSICS

Humphrey Bogart
Gregory Peck
Ingrid Bergman
Elizabeth Taylor
Gary Cooper
Cary Grant
Henry Fonda
Alan Ladd

With Host Jeffrey Lyons

Radio Adaptations of Movies as Heard on
The Peabody Award Winning Series, The Lux Radio Theatre
African Queen • Shane • The Maltese Falcon • High Noon • Little Women
Laura • Casablanca • Spellbound • It's a Wonderful Life... And Hundreds More!

Sixty-Minute Format • Weekly • Barter

For More Information and a CD Demo, Contact
DAVID P. WEST AT 1-201-385-6566.

e-mail dbasyndicators@prodigy.com
Another Fine Radio Program From Dick Brescia Associates

More Mega-Groups, DOJ Concerns

► QUARTER, continued from page 21 were inconceivable. Now, he said, "the bar has been raised," and the idea of one group with more than 1,000 stations is not out of the question.

"It's a bit of a surprise that CBS has extended its focus beyond the largest markets," Pruet said, commenting on the late-quarter announcement. He said it will be interesting to see who emerges as the new consolidators for the next tier of stations.

Several other groups disappeared this quarter when previously announced deals closed. The name Evergreen Media, for instance, retired when Evergreen and Chancellor Broadcasting became Chancellor Media (NASDAQ:AMFM) in early September. The Viacom Radio Group also became part of history in the third quarter after the completion of its \$1.075 billion buyout by Evergreen and Chancellor in early July.

According to Bowman, at the time of The NAB Radio Show in September, there were 400 fewer radio owners than there were in September 1996.

Readily accessible money is helping to drive this consolidation. Bowman said that, on average, radio stocks were up more than 70 percent this year. If some of the major mergers start to unravel, Bowman said the radio stocks could fall, which could "cast a pall" over the industry.

Positive future

The upside is that the radio industry today is leveraged with public and private equity. Bowman said a fall in stock prices would not create a shaky environment such as radio experienced in 1991, when the economy faltered and many groups were "up to their neck in debt."

Wall Street is watching radio groups closely. Standard and Poors put at least three of the top 10 radio groups on a "CreditWatch" in the third quarter. SFX Broadcasting and Capstar Broadcasting Partners were put on CreditWatch with "developing implications," which means that the company's ratings may be either raised or lowered based on future actions.

S&P put ARS on CreditWatch when it was announced the company was for sale. After the Westinghouse announcement, the implications were revised from "developing" to "positive" because of the prospects for credit improvement when the company is combined with Westinghouse.

Westinghouse, however, which had been on CreditWatch since June, saw its S&P implications change from "developing" to "negative" after the announcement of the sale.

Private money also is playing a large role in consolidation. Pruet said the private equity business is "awash in dollars." Hicks, Muse, Tate & Furst Inc. probably is the most well-known example of the impact private equity has had on the radio industry.

Seth Fineberg, associate editor of Venture Capital Journal, said new venture capitalists, a subsection of the private equity business, have raised close to \$5 billion since the beginning of the year alone.

Although the availability of equity is a sure thing for big radio, the Department of

Justice remains the wild card. The DOJ is "looking" at both the SFX and the Katz acquisitions. The Westinghouse/ARS deal no doubt will also fall under the antitrust microscope.

Three is the magic number

Radio rumors continue to develop as a way to define the gray measuring stick Justice uses in its decisions. One recent rumble was that the DOJ does not want to see markets with fewer than three major players.

There is "not a clear bright line," a Justice Department spokeswoman said. The antitrust division, she said, makes its decisions based on the specifics of

each case. At a congressional subcommittee hearing in September, Assistant Attorney General for the Antitrust Division Joel Klein reported that the DOJ had investigated hundreds of radio mergers since the passage of the Telecommunications Act. As a result of those investigations, he said, the DOJ took enforcement action against seven radio mergers, resulting in the divestiture of 12 radio stations.

Radio also celebrated a great milestone during the third quarter: five years of increasing advertising revenue. National business is driving the double-digit growth. In July, for instance, total local and national fig-

ures were up 11 percent over July 1996. National spot advertising grew 16 percent. In western markets, national business was up 21 percent over last July. Figures are from the Radio Advertising Bureau.

Although good news for the industry, the record period of revenue increases is not as stunning as the record-breaking group sales taking place. Observers agree this break-neck consolidation will not happen again. Once it is complete, probably several quarters from now, the next round of sales will occur. That, observers say, will be when big radio realizes it has gotten too cumbersome and starts to sell its mistakes.

■ ■ ■

Lynn Meadows wrote about the pending RFR deadline in our Oct. 1 issue.

Industrial Strength Digital Audio Delivery

Digital Audio Delivery systems are now recognized as a must for every broadcast facility. But few systems provide the features, flexibility or reliability required to maintain profitability in this demanding and fault critical application, nor the support mechanism to maintain them.



The ENCO DAD_{PRO32} Digital Audio Delivery System is simply the most powerful On-Air & Production system available. Based on the already widely accepted and mature DAD_{PRO} product, but now optimized for the Windows NT[®] operating system, DAD_{PRO32} is unique in its uncomplicated user interfaces and adaptability to any format, yet harnesses the power and reliability of proven technology.

- Intuitive On-Screen User Interfaces that are immediately familiar to operators. Optional Touchscreen makes Live Assist operation quick and easy.
- Complete On-Air flexibility for Live Assist, Automated, or Satellite Programmed operations, with transparent transitions between modes. Seamless Segues and Voice Tracking provide a continuously "Live" image.
- Powerful Production and Call Processing capabilities, including Graphic Cut & Paste Assembly Editing. Automatic Recording features are included for catching network feeds.
- Interfaces to all Music and Traffic Scheduling and Billing systems.

- Features full 32-Bit Processing and True Multitasking capabilities. Many third party programs, such as Multitrack Editors, Wire Capture systems and Word Processors may be directly embedded into DAD, or operated on the same Workstation.

- Inherent support of Global Wide Area Networking, for sharing of data between multiple facilities. Ancillary products are available for Store Forward operations and remote management of unmanned downlink sites.

- Operates on commonly available "off-the-shelf" computer hardware and network architecture, utilizing any of a wide variety of redundancy configurations.
- DAD is an outright purchase, and there are no monthly licensing fees. Free software upgrades are provided for the first year. ENCO technical support is legendary as the best in the business.

Digigram
POWERED

Call Your DAD Dealer or ENCO For Complete Information or Demo

Check Out The ENCO Web Page At:
www.enco.com

 **ENCO**
SYSTEMS, INC.

24555 Hallwood Court, Farmington Hills, MI 48335 USA
Tel: 800-362-6797 or 248-476-5711
Fax: 248-476-5712 • www.enco.com



Why your worst day in radio is the best day to judge AirTime.

It's your typical day-from-hell at the station: The on-air talent is new. Traffic is in a panic to reschedule commercials. The engineer is stuck at the transmitter. And new owners want the program director to change the format again. Sounds like a perfect day for AirTime, the first on-air digital delivery system created for the real world of broadcast, where non-stop stress seems to be the rule, not the exception.

AirTime offers a unique combination of easy user interfaces to tap the system's real time power: Live Assist touch screens that actually make on-air tasks easier and more productive. Sound Cube looks and feels like an analog cart

machine, which means fully digital on-air delivery without all that staff training time. Sound Slate goes even further, putting a complete range of sound effects and audio at your talent's fingertips.

For commercial scheduling, AirTime's touch screens and easy schedule builder lets you create a commercial once, then access and reschedule it from one powerful database. The same huge, flexible database lets a program director store, organize, and play on-air resources at will.



Best of all, AirTime's UNIX-based operating system gives your station complete multi-tasking in real time. So if running one station isn't challenging enough, now you handle even more stations from a single location with AirTime. Just to make your life easier.

orban[®]

A Harman International Company

©1997 Orban, Inc. Orban and AirTime are registered trademarks. 1525 Alvarado St., San Leandro, CA 94577 USA Phone 1-510-351-3500 Fax 1-510-351-0500 E-mail custserv@orban.com Web www.orban.com

Circle (199) On Reader Service Card

World Radio History

Maltin Recalls Roots of Radio

Bob Rusk

Just when you thought the Lone Ranger had ridden off into the sunset, the masked man is back, inviting us to return to those glorious days when you could turn on the radio and hear a hearty, "Hi-yo, Silver!"

Also along for the ride are Burns and Allen, Amos and Andy, The Shadow, and Baby Snooks. These shows and others, which filled the airways in the 1920s to '50s, are the subject of "The Great American Broadcast: A Celebration of Radio's Golden Age" (Dutton).

Written by "Entertainment Tonight" film critic Leonard Maltin, well-known for his annual "Movie and Video Guide," this book recalls an era in entertainment before television, when listeners created pictures in their minds.

Mind's eye

And what radio show created better pictures than "Fibber McGee and Molly"? Whenever Fibber opened the hall closet door at 79 Wistful Vista, everything inside would come tumbling out. The sequence of ensuing sound effects created one of the longest-running and most hilarious bits on the air, with the listener left to imagine just what Fibber kept in there. "Gotta straighten out that closet one of these days," Fibber would declare nonchalantly.

That show made its debut on the NBC network in 1935, long before Maltin

asked them. "What was there to look at?" It wasn't until years later, when a friend gave Maltin some tapes of "The Jack Benny Program," that he discovered the answer. Maltin was immediately hooked.

"It was a great, great show," Maltin told RW. "It still makes me laugh. My daughter, who is now 11, has been listening to it since she was 5. It was superbly written, with a wonderful cast. They could get laughs no one else could just because

avoid this when using recordings, the book recalls how four tonearms were used on three turntables. In this era before LPs, records only lasted several minutes. When a specific sound effect, such as an airplane in midair, was needed underneath a scene, one arm could be placed at the start of the record, as the other arm reached the end.

"On another turntable, they might have to cue-up a gun shot sound effect," Maltin said. "They worked out systems for any contingencies.

"The most interesting discovery for me was that sound effects people were not technicians; they were artists, they were performers. That's the difference between radio (in) those days and somebody (today) who might try to recreate the same effect using prerecorded sounds ... Sound effects people were performing the sounds in complete harmony with the actors. They had to be in sync with everybody around them."

But, he said, "they also had to be ingenious, resourceful engineers at the same time who could invent their own sounds."

Still on the air

Today major market stations, including CBS station KNX(AM) in Los Angeles, located in the building from which many of the shows originated more than 50 years ago, continue to air old-time radio, testifying to its enduring qualities.

The syndicated program "When Radio Was," now in its eighth year and heard on 300 stations, features such classics as "The Edgar Bergen and Charlie McCarthy Show," "Our Miss Brooks," and "Sherlock Holmes."

"It is heartening that the old shows have built a new audience. This can only continue to grow," Maltin said. "It's never going to be the way it was, but there is room for these shows in a program mix."

Maltin thinks it would be "asking too



Leonard Maltin

much" to expect major group owners to create new comedy or drama shows for radio. But he is encouraged by what he hears on National Public Radio.

"Who would have predicted the success of Garrison Keillor and 'A Prairie Home Companion'? On the surface, there is no way to make that sound like a viable idea of any kind," Maltin said. "Yet his listenership is loyal and enormous.

"There are at least three groups that I know of in Los Angeles that are doing radio drama," Maltin said. "One of them, California Artist Radio Theatre (CART), uses some of the actors from the old days of radio, as well as younger actors." CART presentations, which recently included an adaptation of the classic drama "Gaslight," are performed before live audiences and air on NPR affiliate KPFK(FM).

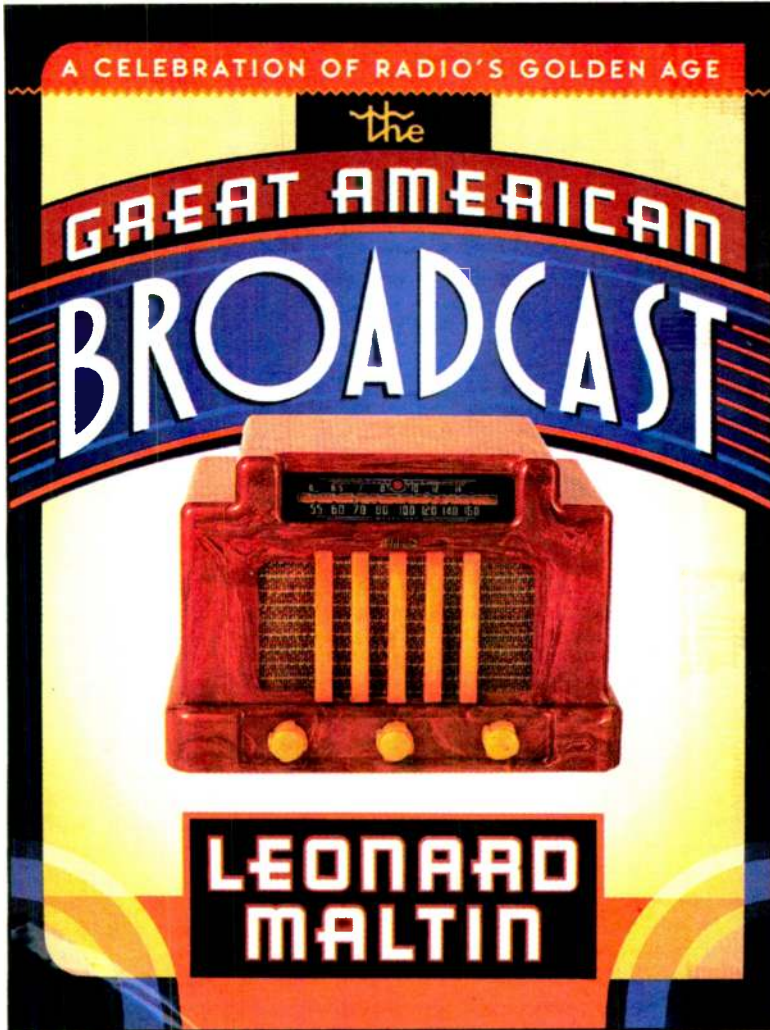
Perhaps "The Great American Broadcast," with its stories of radio's glorious past, will inspire more people to not only begin listening to the wonderful old shows, but to create original programming.

For the book, Maltin spent 10 years conducting interviews with scores of actors, writers, sound effects artists and others who worked in radio's golden age. "The Great American Broadcast" is a must-read for anyone interested in that wonderful era of our business.

"I hope the book will draw some attention to the glories and pleasures of old time radio," Maltin said. "I enjoy these programs and the medium itself so much. I'd love to spread the word about radio."

■■■

Bob Rusk is a broadcast and entertainment journalist, and a frequent contributor to RW.



George Burns and Gracie Allen

listeners knew the characters so well."

One of the biggest laughs came whenever the engine on Benny's rickety Maxell was fired up, only to sputter out. That "car coughing" sound was created by Mel Blanc, who went on to further fame as the voice of Bugs Bunny for Warner Bros. cartoons.

Front yard, over-easy

When great talents like Blanc weren't creating sound effects with their own voices, other people were using an odd assortment of things for effect. The book points out, for example, that an egg beater whirring next to a microphone sounded

like a lawn mower.

The sound effects crew always had to be on its toes. The comedic or dramatic flow of a show could be destroyed if there was a lapse in sound, resulting in dead air for even a second or two. To

was born. A child of the TV generation, Maltin admits in the introduction to his book that he was bewildered when his parents explained there was no such thing as television when they were young.

"You sat and listened to radio?" he

STATION/STUDIO SERVICES

Radio Station Data Base

Only \$100!

Addresses, Formats, Phone, FAX Market Size, Ratings & More!

Also: Group mailing to GMs, PDs, SMs & CEs.

The Radio Mall
1-888-97-RADIO
TOLL FREE

READER SERVICE 106

BUY-OUT MUSIC — \$49

82 :30 & :60 music beds for \$49

328 :30 & :60 music beds for ... \$198

120 production effects "Zings, Zaps and Zoodads" for \$99

122 New Lasers & Sweepers for ... \$99

For FREE DETAILS on production music, sound effects, call

Ghostwriters (612) 522-6256

READER SERVICE 108

ATTENTION PROVIDERS!

Promote your services to **Radio World's** 18,000+ readers. Reach Radio Station and Recording Studio owners/managers and engineers with your message. For information on affordable advertising call **Simone** at **1-800-336-3045, extension 154.**

RULE BOOK

Main Studio Rule: The History

Harold Hallikainen

The Federal Communications Commission has proposed changes in the location requirements for the main studio and the public inspection file. We looked at the proposal in RW's Aug. 20 issue.

While the FCC ponders comments from the industry, let's review the history of the rule.

Radio Act of 1927

In 1926, Congress was concerned that there was "an unjustifiable grouping of stations within limited areas." To dilute

this concentration of radio stations around large cities, Congress enacted Section 9 of the Radio Act of 1927, which provided that "the licensing authority shall make such a distribution of licenses, bands of frequency of wavelengths, periods of time for operations, and of power among the different States and communities as to give fair, efficient, and equitable radio service to each of the same."

In 1934, Section 9 of the Radio Act was re-enacted into the Communications Act of 1934 as section 307(b). In 1939, the FCC adopted rules requiring each station to have a studio in the

community it is licensed to. This is similar to the current rule!

As early as 1948, the FCC found that stations were abandoning the communities they were licensed to serve. A Report and Order adopting the main studio rule was adopted in 1950. Under the new rule, stations were required to originate two-thirds of their non-network programming or 50 percent of their total programming (whichever is less) from their main studio, which was to be located in the community to which the station was licensed or at the station's transmitter site.

The commission also commented, "We

have consistently held that the term 'radio service' as used in section 307(b) comprehends both transmission and reception service. Transmission service is the opportunity which a radio station provides for the development and expression of local interests, ideas, and talents and for the production of radio programs of special interest to a particular community. Reception service, on the other hand, is merely the presence in any area of a listenable radio signal. It is the location of the studio rather than the transmitter which is of particular significance in connection with transmission service. A station often provides service to areas at a considerable distance from its transmitter, but a station cannot serve as a medium for local self expression unless it provides a reasonably accessible studio for the origin of local programs.

"It is apparent that section 307(b) and the commission's efforts to apply it may be largely frustrated if, after a station is licensed for the purpose of providing both reception and transmission service to a particular community, it removes its main studio to a distant point and originates all or substantially all of its programs in a city or town other than that which it was licensed to serve."

Suburban community policy

The FCC adopted the Suburban Community Policy in 1965. This policy was expanded by the Berwick policy to cover FM and TV in 1968.

These policies attempted to determine the actual intent of the applicant for a new station. An applicant for a new station proposing to serve a suburb of a large community would have a 307(b) preference over one proposing to serve the large community, often gaining the license for the new station. Once granted, however, these licensees might "abandon" the licensed community and direct their programming towards the larger community, frustrating the purpose of the preference.

These policies were reviewed and abolished in 1983. The FCC stated that the significant increase in the number of stations since the adoption of the policies made the policies obsolete. It may be more economically desirable for a station to be a "big fish in a small pond" by serving the small community instead of being the one of many attempting to survive economically by serving the larger community.

Since the main studio rule was still present, the FCC stated, "We fail to see the deleterious effect on the public living in small communities from our authorization of a station that designates the small community as its community of license, locates its main studio in that community, fashions a programming proposal to meet the needs and interests of the smaller community, and then also competes in the larger metropolitan area that includes the community of license."

Arizona waiver

In 1970, the FCC granted a waiver of 47 CFR 73.210(a)(3) to KXTC(FM) in Glendale, Ariz. KXTC had proposed a main studio in its city of license, but wished to originate its recorded music programming from its transmitter site in downtown Phoenix.

It appears that the rules allowed either

See RULE, page 27 ►

YOUR ONE



FOR SATELLITE SERVICES.

NPR Satellite Services can customize your package to include any of the following:

- ✦ Full-time Service - 24 hour programming capability;
- ✦ Occasional Service - lease according to your need -- whether it's for an hour, a day, or an event;
- ✦ Digital equipment;
- ✦ Uplinking services - either portable or fixed - can get you up and running FAST!
- ✦ Top-notch, 24 hour-a-day troubleshooting and monitoring by our System Technical Center (STC).

STOP Your Search...

Call NPR Satellite Services at (202) 414-2626 for more information on your customized satellite services package today. Link up with us for a one-stop solution to your satellite services needs.



NPR Satellite Services®
Link Up With Us

635 Massachusetts Avenue, NW, Washington, DC 20001
(202) 414-2626

► **RULE**, continued from page 26

an AM or FM station to have its main studio at the transmitter site, regardless of the location of that transmitter site. Thus, if KXTC indeed served Glendale, its city of license, but originated its programming from the transmitter site in Phoenix, all should be well. However, KXTC proposed a main studio in its city of license, then proposed to not originate the majority of its programming from that main studio. Thus the need for the waiver of the program origination requirement.

The station was proposing that 68 percent of its broadcast week be devoted to entertainment programming consisting of recorded music originating from the transmitter site in Phoenix. The FCC commented "the 50 percent program origination requirement is merely a means of assuring that a station serves the local needs and interests of its community. It is clear, however, that this end is not always achieved by the rigid application of a fixed minimal percentage requirement, without considering the nature of the programming involved. As long as a studio is maintained in the community of license for the purpose of presenting local ... programming ... it appears unrealistic and unreasonable to require that a majority of all of the station's programs originate from such studio, when, in fact, a majority of the station's programs consist of recorded music."

Current rule adopted

In 1986 the FCC further relaxed the main studio rule. In response to a petition from the "Arizona Justice Committee," a group formed in response to the Arizona Waiver, the FCC proposed eliminating the program origination requirement and allowing a station to place its main studio outside the community of license as long as it remained within the station's city grade coverage area.

In the Report and Order, the FCC allowed the main studio to be located anywhere within the station's principle community contour (or at the transmitter site of a co-owned AM licensed to the same community), removed the program origination requirement and removed the provision for dual city licensing. The commission did, however, continue to require the Public Inspection File be located within the community of license. (A limited stay of the Public Inspection File location requirement was issued later, permitting stations that already had their file located at their AM transmitter main studio to continue to do so.)

The FCC recognized that use of the principal community contour "may afford some licensees greater flexibility than others. ... We believe, however, that its use best balances our objectives. It ensures that the main studio is located in the primary reception area of the station, and will permit collocation of the main studio and the transmitter in all cases."

Main studio definition

Seven petitions for reconsideration and clarification were filed in response to the rule change. In response to requests for a definition of a main studio, the FCC responded, "A station must maintain a main studio which has the capability adequately to meet its functions ... of serving the needs and interests of the residents of the station's community of license. To fulfill this function, a station must equip

the main studio with production and transmission facilities that meet applicable standards, maintain continuous transmission capability, and maintain a meaningful management and staff presence.

"The term 'main studio' continues to designate a broadcast station's only studio when no auxiliary studio is maintained. If a station has two or more studios that meet the applicable criteria, it may select one (within its community contour) to designate as its main studio."

Meaningful management

Jones Eastern of the Outer Banks Inc., owner of WRSF(FM), got the FCC to define the management and staff presence requirement, though the company was fined. WRSF maintained a studio outside the principal community contour and another within the contour (the main studio). With a total station staff of about

The commission often now uses market forces to determine policy instead of regulation.

20, the main studio was staffed by a full-time "office manager." In addition, the business manager spent four hours per week at the main studio, the general manager spent two hours per week there, and the senior account executive spent some time there. The FCC stated, "In our 1988 clarification, we did not formulate a 'bright line' test to define a 'meaningful presence.' We find, however, that a staffing situation like the one Jones Eastern proposes renders the commission's concept of a main studio virtually meaningless.

"We find that a main studio must, at a minimum, maintain full-time managerial and full-time staff personnel.

"This is not to say that the same staff person and manager must be assigned full-time to the main studio. Rather, there must be management and staff presence on a full-time basis during normal business hours to be considered 'meaningful.'"

Unattended operation

In 1995, the FCC adopted rules permitting the unattended operation of broadcast transmitters. Although this would appear to permit the operation of a station with full automation, several FCC staff members pointed out that the staffing requirements of the main studio rule required minimum staffing levels at the main studio during "normal business hours."

Thus, it appeared, true unattended station operation during normal business hours was not possible. This interpretation, however, seems to disagree with footnote 11 of 7 FCC RCD 6800 (1992) which states, "We are fully aware, as NAB demonstrates, that a significant body of stations have only a limited number of employees ... Unlike WRSF, stations of this size will generally not have more than one studio. In such circumstances, where the employees report to work to the main studio, we have no intention of limiting their ability to leave the studio to conduct station business."

Recent e-mail from FCC staff reads, "As far as a one-person 24-hour station goes, I agree with you that footnote 11 appears to condone such operation. Might not be a bad idea to check with Mr. Kelley (chief of Mass Media Bureau's Enforcement Division) before suggesting to too many people to go to fully automatic operation."

Repeated e-mail requests for comment went unanswered. I did get a chance to ask Kelley about the main studio rule and unattended operation at this year's NAB convention. He told me that a proposed rulemaking regarding the main studio rule was in the works. However, in the NPRM we find no discussion of unattended operation and staffing levels.

The broadcast industry certainly has changed. There are far more stations on the air than when these rules were put in place or last revised. Perhaps competition among stations now encourages them to serve their licensed communities, removing the need for the main studio rule.

It is unlikely that removal of the main studio rule would put us back to the position of 1926, when the vast majority of stations were immediately surrounding large cities. We may, however, find stations "abandoning" their suburban communities by concentrating their programming on nearby larger communities.

The commission often now uses market forces to determine policy instead of regulation. This may be justified by the increase in the number of stations, or may just be the changing times. Are market forces adequate to ensure that communities are served by stations licensed to them (or perhaps stations licensed to other communities)?

■ ■ ■

A more detailed version of this article is available on the World Wide Web at <http://www.broadcast.net/hallikainen/inside.html> or by fax from Hallikainen & Friends at (805) 541-0201 (call from your fax machine and request document 0095).

Harold Hallikainen can be reached via e-mail at hhallika@slonet.org

You Read It Here

One Year Ago

We applaud the NAB's decision to return to a radio-only show, and we look forward eagerly to next year's convention.

(WME) floor traffic was underwhelming, and NAB is accustomed to impressive numbers. Some attendees were confused by the floor layout, and exhibitors grumbled privately that the business didn't justify the trip.

"Adieu, World Media Expo"
RW Editorial
Oct. 16, 1996

Five Years Ago

Digital audio broadcasting (DAB) took a major step from the drawing board to the airwaves with a live demonstration and a host of forums on the burgeoning technology at the NAB Radio Show. ...

The annual convention ... featured in-band, on-channel tests from USA Digital Radio.

"DAB Basks at Radio '92"
News Item
Oct. 1, 1992

Ten Years Ago

The FCC has rejected a plan that would use an "index" method in order to classify FM stations that do not fall into specifications for particular classes. ...

The index method, according to the FCC, involves the establishment of a "formula reflecting the maximum permitted distance to the expected service contour (1 mV/m) of each class."

"FCC Rejects FM 'Index' Plan"
News Item
Oct. 15, 1987

NAUGHT. NADA.

BE It's Back.

High School Radio Lessons

Neil Sanderson

Everyone knows that high school students are some of the most ardent radio listeners. More remarkable is the fact that thousands of them actually run their own FM stations at school, carrying on a tradition that began 50 years ago.

Actor Harrison Ford honed his skills at a high school station in Illinois. The writers of "Beverly Hills 90210" included school radio in their portrayal of cool California teenagers.

Hundreds of radio and television professionals began their careers covering school sports or playing record dedica-

tions between classes. But high school radio isn't just for aspiring broadcasters. Teachers and students agree that radio offers valuable lessons for anyone.

Life skills

"Radio is one of the best ways a school can prepare students for the real world," said Brian Werner, former student manager of WHHS(FM) at Haverford High School in Havertown, Pa., near Philadelphia. Werner, who graduated this year, said high school radio allows students to manage "something that most adults don't even get the chance to experience."

WHHS has provided "real-world experience" for students since 1949. The station is completely student-run. Listeners within 10 miles of the school can tune in to alternative music, school sports and the weekly news program "Haverford Happenings."

Werner believes radio helps students build confidence. "Talking in front of a mic is much easier than in front of a room full of people," he said, "but radio really prepares students for that type of situation."

Tom Marble, a teacher and adviser for KDXL(FM) at St. Louis Park High School in Minneapolis, agrees that students gain confidence, plus a strong

sense of responsibility and organizational skills from their experience in radio.

"I let kids know that I take this station seriously," he said. "If they sign up to do a show, that means they are there on time every day and prepared."

KDXL, like WHHS, has a modest 10 W signal, but Marble said students know they must follow station rules and the broadcasting regulations. "If they screw up, it could cost us our license," he said.

High school radio demands a lot from students, but offers unique rewards.

During school hours, WJEF(FM) caters to adults by playing oldies from the 1950s to the '80s.

Introducing

A NEW WAY TO MAKE MONEY!

The Broadcast Press

Your Radio Station in Print



What is The Press?

The Press is a fully customized, station specific magazine. To date, most station magazines have been 'format magazines.' Your call letters were inserted into someone else's agenda. The Press is different! It's written and produced for your listeners.

The Press is YOUR magazine. Except we do the work!

Plus, you make money!

How? Gain access to print dollars in your market. Double your profit by using our 50% spot trade option.

The Broadcast Press

For the price of a single direct mail piece, you can have a 32-page full color customized magazine. How? We're a publisher! We have the staff, equipment and know-how. Plus, we save on the printing of the product. Sign on now for *special charter discounts!*

Get started today!
Call 1-800-336-3045 x258



The Broadcast Press is completely customized!

It's even designed to fit your budget!

With every issue:
Drive Cume
Build Listener Loyalty
Generate Revenue

"The station has been a bonding activity for students who did not participate in sports or other extra-curricular activities," Marble said.

The value of radio is apparent in Lafayette, Ind., where teacher Randy Brist directs a 250 W station at Jefferson High School.

"The most important thing students get out of working at WJEF is learning to work well with others," Brist said. "There is little room for hot dogs or individuals who want to run the whole show."

After 13 years in the job, Brist knows that students sometimes need help dealing with the pressure and responsibility of broadcasting.

"In my first year, we broadcast the semi-state basketball final and we lost our telephone connection," he said. The student in the control room cursed while his microphone was on.

"I was quite embarrassed, but it was a 'teachable moment.'"

WJEF(FM), which has been on the air in Lafayette since 1972, is unusual among high school radio stations because it shuns contemporary music. The station, which is only on the air during school hours, caters to adults in the community by playing oldies from the 1950s to the '80s.

Participation

Keeping a radio station on the air is a team effort. "Over 100 students were involved with KDXL last year," Marble said. "By a pure numbers count, it was a more popular activity than any sports team in our school."

"The ratio of boys to girls is probably four to one," Marble said. "I believe boys tend to have a natural interest in the gadgetry of radio, whereas girls tend to be intimidated at first."

Brist cites the same four-to-one ratio at WJEF and agrees there may be a "technology wall" for some girls.

For a few students, high school radio is about more than "life skills"; it is the first step toward a career in broadcasting. Although the working environment can be quite realistic, mistakes are forgiven.

See SCHOOL, page 29 ►

'All-Whale' Radio to Air in Canada

James Careless

"All whales, all the time."

That is the format promised by ORCA-FM, a new Canadian station proposed for Robson Bight on Vancouver Island's northeast coast in British Columbia.

It sounds like a crazy idea, but ORCA-FM is no attempt to take commercial niche marketing to the extreme. Instead, the station is part of the WhaleLink educational display being constructed by the Vancouver Aquarium. The exhibit is due to open in the spring.

Focus on killer whales

The Vancouver Aquarium (VA) focuses on orcas — also called killer whales, although they are more closely related to dolphins than whales — because the Pacific Coast of British Columbia is "the best site to find killer whales in the world," said VA Director of Research and Conservation John Ford.

In turn, Robson Bight is a popular location for whale watchers, because so many whales pass by the site as they swim along the coast.

As whales swim, they emit clicks, whistles and other sounds that can be heard for miles underwater. What makes these sounds so useful to researchers is each family — or pod — has a unique dialect.

Killer whales "have a very unusual social system where the families stay together basically for life," Ford said. As a result, he said, "You can actually, with just a few minutes of listening, identify every pod reliably just by listening to it."

For this reason, the aquarium has established a network of six hydrophones — underwater microphones — along the coast. By listening in, Ford can keep an eye on where each pod is going, and, judging by the sounds being made, whether the whales are hunting, playing or resting.

In the past, the hydrophones were

monitored by lighthouse keepers. However, now that the lighthouses are being automated, the feeds are being redirected directly to the aquarium via cellular telephone.

The cellular system is unique in that it is "voice-activated" by the whales them-

continuous feed, despite our sponsorship from the phone company. So we decided to try and do an RF link."

Once the possibility of broadcasting the whales occurred to Ford, he began to think that if the VA was going to try get a license for an RF link, why not



The WhaleLink Site Beacon

selves. If a hydrophone picks up more than 5 minutes of a whale song, then it automatically dials up the aquarium, and transmits the signal by phone.

Of course, setting up cellular links from remote, rugged coastal locations to the aquarium is no easy feat. This is especially true for Robson Bight, which was selected as the site for a continuous feed to the VA WhaleLink display.

The location, Ford said, is about six miles from the nearest civilization. "The cellular system just would not work for a

just put the signal on the FM broadcast band, too?"

"The hundreds, even thousands, of whale watchers that go the area each summer could actually tune into this underwater microphone and listen live to the whales that they are looking at," said Ford. "This is what led to ORCA-FM."

Transmission power

However, just because ORCA-FM is proposed for the broadcast band does not mean it will be a conventional broadcast station.

For one thing, the transmission power will not reach any major market.

Because ORCA-FM only has to cover six miles to reach a telephone line, Ford said, the system will begin operating with only 1 W of power. "But it should be receivable in the whole area where people watch the whales," he said.

Also, ORCA-FM will not have a studio or even a building. Instead, the "station" will be tucked neatly inside a Canadian Coast Guard navigation beacon and connected to the hydrophone via an armored underwater cable. Power will be supplied by solar-powered batteries.

Finally, there will not be any staff at ORCA-FM. All the listeners will hear is "whales, whales, whales," plus a digitally synthesized voice occasionally offering station identification and time in keeping with government regulations.

Commercial prospects?

As for the possibility of commercials on "All Whale Radio," Ford does not rule out the idea. However, "I think I would like to keep that to a minimum, just so we are not busting into the whales' conversations very often."

The big question, of course, is whether the Canadian government will approve ORCA-FM. After all, in a country that only recently authorized the existence of all-hit radio on FM, wall-to-wall whale audio is quite a departure.

However, Ford said the ORCA-FM concept was well received during a Canadian Radio-Television and Telecommunications Commission (CRTC) licensing hearing in August. In fact, "Industry Canada and the CRTC folks we have talked to have been very helpful and pretty keen about the project," he said.

In fact, given the availability of spectrum in the region, the tiny proposed coverage pattern and the educational purpose of ORCA-FM, it is likely that the commission will give the station permission to go on air.

If this happens, whale watchers will soon be able to hear — as well as see — killer whales as they swim past the Bight.

■ ■ ■

James Careless wrote about Internet webcaster SportsLine Radio in our Sept. 17 issue.

► SCHOOL, continued from page 28

Another station that has produced a number of professional broadcasters over the years, and is still doing so, is WSHJ at Southfield Senior High School in Detroit. Vic Doucette, a student during the '70s, said the most

had a tight format we were expected to follow to the letter," he said.

High school stations are well-positioned to assist students wishing to make a career in radio. Until a few years ago, a student might have done odd jobs at the local AM daytimer, hoping to get some experience on the air. Today, many local stations have little need of staff, thanks to hard-disk automation and syndicated programming. At high school stations, however, most of the programming is still "live and local."

"Radio is one of the most fascinating activities any school could have," Marble said. "I certainly wish I had had it when I was in high school. I probably wouldn't have graduated — on purpose!"

■ ■ ■

Neil Sanderson is a radio trainer and consultant based in New Zealand. He wrote in our March 19 issue about Christian missionaries operating radio stations in the Pacific Ocean, including U.S. territories.



Jason Baldwin broadcasts from the master control room of WJEF, Lafayette, Ind.

important things he learned at WSHJ(FM) were "discipline, discipline, discipline."

Doucette, who has worked at stations in Michigan and Florida, said he was amazed to discover professional radio wasn't much different from his high school experience.

"At WSHJ we 'worked' radio. We

ZERO. ZILCH.

BE The Engineer's Dream Machine.

Radio Disney: 'The Fun Begins'

ABC Radio Networks chose The NAB Radio Show to celebrate Radio Disney, its new 24-hour network for children.

The network wants everyone in the industry — especially the naysayers — to know that it is fully behind kids' radio.

ABC Radio extensively tested the new format before announcing, earlier this year, that it planned to roll out the network on a national level. The timing of the announcement was unfortunate, as Disney soon found itself embroiled in a highly publicized boycott by the Southern Baptist Convention. The boycott has spread to other religious organizations, but the scope of the boycott from some of those organizations is much nar-

rower, with ABC Radio seemingly an afterthought, if that; Disney film and ABC television content have thus far provoked the most wrath.

With the industry gathered together in one city, ABC wanted the focus to be on its new format.

"It's our first opportunity to showcase the product, to launch it appropriately," said Scott McCarthy, vice president and general manager of Radio Disney, who said the show provided ABC its first opportunity to "appropriately" launch the new format. "Now the fun begins," McCarthy said.

ABC Radio continues to move ahead with Radio Disney, recently acquiring

Seattle station KKDZ(AM), which had tested the format for several months, and picking up Los Angeles affiliate KTZN(AM) and a Boston affiliate. The four stations that tested the format continue to air it: KDIZ(AM), Minneapolis/St. Paul; WYDE(AM), Birmingham, Ala.; WDWD(AM) Atlanta; and KCNR(AM), Salt Lake City.

The test phase is over, but McCarthy said Disney will continue to research its audience as it rolls out the new format.

"We've made some slight programming changes ... jock breaks, those types of changes. We'll continue to do that every month. There haven't been any big problems."

AM signal strength remains the biggest factor in affiliate sign-ups. McCarthy said it is of "the utmost importance" that affiliates have a strong signal, "particularly during the daytime hours." McCarthy acknowledged some signal weakness in Minneapolis, where the station powers down at night, but said Radio Disney is "by and large very happy" with its affiliate signals.

— Chris Hamaker



MASTER CONTROL

The world's finest on-air system.

Live Assist • Voice Tracking • Split Spot Feeds •



Hundreds of Cities Worldwide

Satellite Automation • News & Talk Radio Ready • Novell or NT •

RCS
Sound Software

(914) 723-8567 • www.rcsworks.com

Tips to Keep Your Sales Staff Happy

Chris Hamaker

The high turnover rate in radio sales has given the profession a bad image. So said Roger Utneher, president of Nicolet Broadcasting in Park Falls, Wis., at a session of The NAB Radio Show.

Utneher presented several useful tips for managing salespeople. He also declared that radio's share of the advertising pie is unacceptable.

"If we're going to get more than 7 percent, we have to do something different," he said, suggesting implementation of new sales management techniques.

Some managers emphasize the old adage, "Always be selling." But central to Utneher's philosophy is that station managers not neglect recruiting.

Utneher suggested using classes on radio sales as a recruitment tool. He said real estate sales seminars have brought in successful salespeople to that field, and the same can be true of radio.

Other professions from which radio might take a cue include fast food and the airlines, which both use checklists to clarify responsibilities and keep people accountable.

Potential advertisers who express reluctance to buy into radio can be convinced of the value of radio advertising through advertiser testimonials. Utneher suggested putting a successful client on the air, responding to the very fears expressed by some potential advertisers. "Slowly and deliberately brainwash" the potential client, Utneher said, until they come on board.

Other sales management tips from Utneher:

- Prevent the Monday-morning blues by issuing a Monday "good company news" report.
- Pay a staff member \$100 per quarter to be the company "Director of Fun," responsible for acknowledging staff anniversaries, birthdays, etc.
- Post signs and write memos reminding salespeople of the advantage of radio advertising. "Repetition is the basic element in advertising and sales training," Utneher said.
- Request cash payment in advance from advertisers. "Ask and you get. Don't and you won't."
- Kick rude clients off the air every once in a while. This commands the respect of salespeople.

Equip Your Systems for the '90s

Sharon Rae

Ready or not, here it comes. The times they are a'changing, and the radio business is anything but immune from the wave of technology sweeping all aspects of our industry.

"It's wake-up call time," said Bill Hess, regional vice president, programming and operations, Atlantic Star/Capstar. He made his comments during a session at The NAB Radio Show last month.

"Managers need to be ready to embrace the new information-based technologies and they need to send that message to their staff. We all need to get together to figure out the best ways to create the efficiencies we need by using the technologies."

Know your system

Tom Rodman is marketing manager of manufacturer RCS for the Midwest region. "The most overwhelming point driven home to me was this notion of traditional engineering skills and knowledge being less and less impor-

agers aren't ready to embrace technology and have at least a reasonable depth of understanding, they are going to have some problems with it. The hardware and software of the various computer systems that are affecting every part of your operation are coming out of the back room and going into the board room."

VanBenschoten stressed the significance of compatible systems among different properties and the importance of a manager's understanding of fluid connections within those systems.

"You've got various different types of software systems within a single operation that have to interconnect," he said. "They are all like a string of dominos. Something that happens in one system is going to impact another and another and on down the line, from sales through operations through programming, they are all interconnected."

VanBenschoten also spoke of the impact of consolidation, thanks to deregulation.

"This is the era of the mega-owner," he said. "While there are some economies of scale to be realized in the

or didn't play that were scheduled, along with what spots aired that were not scheduled."

Hansen said the true test of time is the

only thing to determine the success of the new information-based technologies.

"Not all managers are ready for this," he said. "Some are afraid of computers and still want to write the log. But there are also some go-getters who want to ... get this going. It depends on the manager."

**Something that happens
in one system is going to impact another.
They are all interconnected.**

— Tom VanBenschoten

tant to the engineer, and MIS-type skills and knowledge becoming more and more important," he said.

Rodman outlined two categories of information-based technology in radio.

"There are business- and office-type systems," he said. "I call those the behind-the-scenes systems, things that don't actually produce things you hear in the product on the air.

"The second is the digital audio product-type systems — things to produce commercials and programming that actually go on the air," he said.

Rodman agreed that managers must prepare themselves in the technology arena.

"I think a lot of times, managers up until this point have been looking at each of these as a separate problem," he said. "We need to address traffic and billing ... and digital audio or music scheduling. Or else you wind up with incompatible systems that don't reap the real benefits that could be there if these things were talking and cooperating.

"For example, when the traffic system changes the length of a stopset, my music scheduler needs to know because it has to change the songs so the hour times out. If these packages are all cooperating, you can reap those benefits. But if a manager is not aware of the possibility and blindly goes out just addressing these as separate disparate issues, the real benefits will never surface."

Tom VanBenschoten, vice president of sales and marketing for Enterprise Systems Group, Inc., said, "If the man-

consolidation, attention must be paid to the informational infrastructure so that reporting can go from corporate back to the stations and vice versa. There must be a corporate roll up."

VanBenschoten said structure set-up is crucial.

"A lot of thought and preparation has to be given in the outset to determining a structure that matches your business and financial plan," he said. "If you go out and try to build a computer system to do the corporate roll up that doesn't match what your corporate culture is and how you want it reported, then it's going to be nothing but frustration."

Computer evolution

Jeff Hansen, staff engineer of WHO(AM)/KLYF(FM), Des Moines, Iowa, said he sees technology snowballing.

"We started out with PCs replacing dumb terminals. People found out that they could run other things on there besides just the financing package or the traffic and billing program," he said. "So you had word processors popping in there, and then some spread sheets, and pretty soon everybody wanted more and more, and the 286 came out, then the 386. It's the evolutionary process that we've all witnessed over the years. Now we're up to everything from remote access to digital audio boxes being able to talk to the traffic and billing boxes.

"We can, at the flick of a button right now, go into yesterday's log in AM or FM, find out what commercials played

Interrep's Top 8

Growth Categories Ranked by Radio Spending Increases

Dollar Growth

1997 Projection vs. 1996

(numbers in millions)

1. Business & Consumer Services.....	\$55.5
2. Direct Response Companies.....	\$54.2
3. Publishing & Media.....	\$44.1
4. Computers, Office Equipment.....	\$31.8
5. Confections, Snacks & Soft Drinks.....	\$27.9
6. Retail.....	\$25.7
7. Automotive & Accessories.....	\$24.6
8. Food & Food Products.....	\$22.4

Percent Dollar Growth

1997 Projection vs. 1996

1. Business Propositions & Employee Recruitment.....	164%
2. Sporting Goods, Toys & Games.....	146%
3. Direct Response Companies.....	115%
4. Apparel, Footwear & Accessories.....	79%
5. Soaps, Cleansers & Polishers.....	73%
6. Household Equipment/Supplies.....	64%
7. Computers, Office Equipment.....	63%
8. Confections, Snacks & Soft Drinks.....	40%

Note: Figures are the amount of increase between actual 1996 and projected 1997 spending. Categories with less than \$1 million in spending during any six-month period were eliminated from above ranking as projections would be very unstable. Source: Interrep.

NIL. ZIP.

No More, No Less.

Studio Sessions

**Mic Processor
From dbx
Makes Points
See Page 34**

Radio World

Resource for Radio Production and Recording

October 15, 1997

Burning Bytes With Yamaha CD-R

Carl Lindemann

If you have not purchased a recordable CD drive (CD-R) unit already, you likely will be adding one to your production set-up — and perhaps your home PC — soon.

Better software, increased user-friendliness and dropping prices finally have brought the power of CD-R into the mainstream.

“CD-ROM” drive and a “CD-R” drive.

Conventional CD-ROM drives boast read speeds of up to 24x, seemingly astronomically high claims that have led to debate as to how they are determined. Standards for determining speed vary.

In contrast, CD-R recording drives operate at speeds that seem rather pedestrian — only as fast as 8x.

In terms of real-world usability, ultra-

Yamaha went beyond the original specs and the soon-to-be updated Orange Book will establish 4x as part of the standard.

It is true 4x CD-Rs command only 20 percent of the market, due mostly to their higher cost, which is several hundred dollars more than 2x units. But another consideration in purchasing any new device is how well it fits with the rest of your equipment. Computers are, after all, systems; the interrelation between elements determines overall performance.

Big Buffer is watching you

The Yamaha CDR400t I tested has a large 2 MB buffer. This is a high-performance unit that works well in professional applications.

Installation was easy. The CDR400t connects through the computer's SCSI interface. Despite the fear that configuring SCSI peripherals can be problematic, installing the drive was no more difficult than attaching a standard ATAPI CD-ROM.

Using an Adaptec AHA-1542 bus-mastering SCSI card, Windows 95 immediately identified the drive.

As a data archiver, the Yamaha CDR400t performed flawlessly in its packet-writing mode. The drive appeared to the computer as any other storage device and was just as reliable.

I experienced no previous problems whatsoever getting 2x units to integrate with a number of computers. I did run into a few glitches here.

The real challenge came in recording audio CDs. At first, I had difficulties achieving the drive's full 4x capabilities. I took every precaution — shutting down all TSR background programs, disconnecting from the network and defragging the hard drive — but experienced numerous fatal buffer underruns that ruin CD-R media. Dropping down to 2x speed, the

See CD-R, page 35 ▶

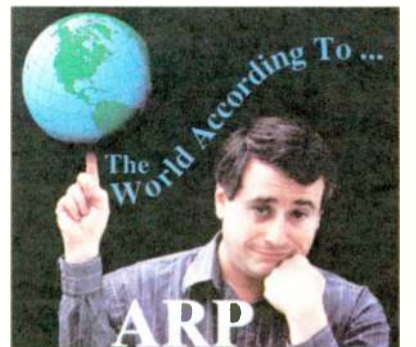
Where Will You Be in Five Years?

Alan R. Peterson

One question I've never looked forward to during radio job interviews was, "Where do you see yourself in five years?"

Not because I didn't have an answer for it — I used to give the kind of answer the program director wanted to hear, just to get the job.

Looking back to 1992, any on-air talent who inflexibly committed to a five-year plan without a dozen



anticipated mid-course corrections is probably not at the job of his or her dreams today.

It'll never happen

Tell the truth — five years back, while your station was picking out those CD cartridge players and budgeting for that huge new air console, did you ever imagine your entire station could eventually fit inside a desktop computer? The same kind of machine you watched your administrative assistant use to tap out correspondence back in '92?

See ARP, page 33 ▶



Yamaha CDR400t CD Recorder

Choosing between various models and brands means first deciding whether you want a drive capable of 2x or 4x recording. At the high end of the market, both in price and performance, Yamaha has dominated the 4x market since the company pioneered these higher-speed units.

Slow can be good

For studios planning CD-R as a major part of their production cycle, the Yamaha CDR400t provides performance that is well worth the price.

Note there is a difference between a

fast read speeds have a limited usefulness; they were designed mostly for computer games. A production workstation CD-R drive clocking in at 6x is more than adequate for this application.

The fact it is not suitable for gamers may actually be a benefit for managers who often remind staffers of the difference between work and leisure activities!

Recording seems slower still. A speed of 4x (600 Kbs) is enough to push the envelope. Strictly speaking, 4x is not "Orange Book compliant" because those original specifications only covered 2x recording.

Audio Solutions

Audio testing requires specialized solutions. Audio Precision offers three lines of audio analyzers for engineering and production testing.

ATS-1

- * Analog audio test system — 2 channel with advanced front panel operation & GPIB interface

- * High performance: System THD+N $\leq 0.0025\%+3\mu\text{V}$
- * Cost effective

System Two

- * A new standard for today's digital and analog audio systems
- * PC Multimedia & Digital interface testing
- * Reduced bit-rate codec testing for audio & telecom
- * Analog residual THD+N $\leq 0.0004\%$ (-108dB)
- * Digital analyzer residual $\leq -140\text{dBFS}$, wideband



System One

- * The Recognized Standard for analog & digital audio testing
- * Windows 95™ software or GPIB interface
- * High speed FASTTRIG synchronous multitone testing on DSP versions
- * Digital I/O on Dual Domain™ versions

**Audio
precision**

P.O. Box 2209
Beaverton, OR 97075-3070
(503) 627-0832, 800-231-7350
FAX: (503) 641-8906

Thousands of customers worldwide choose Audio Precision analyzers because we offer a complete family of audio testing solutions.

Fast-Forwarding Five Years

► ARP, continued from page 32

While you would still be amortizing the console purchase?

Five years back, when you were ordering \$300 boxes of tape every month, would you have believed that same \$300 would one day buy a 4.3 GB disk drive on which you could record and edit? With a little 4:1 data compression, that cheap-o drive holds approximately 25 hours of digital audio.

Sure, you heard the rumors, you read the technical pieces and saw *some* things coming. In 1992 we all stared with mouth agape at the Alesis ADAT, Digidesign's SoundTools II and the CardD "for only \$995." Dalet was just prototyping its four-track workstation and the DSE-7000 had an AKG label on it.

Automation was still high-priced, so DJ jobs were reasonably "safe." In 1992, Broadcast Electronics had the CORE 2000 and the early AudioVAULT. The SMARTS Smartcaster held a total of 240 30-second announcements, and the Computer Concepts DCS unit came with a 238 MB drive to store 59 minutes of linear 16-bit mono audio.

Best of all, you were still pulling those guerrilla tactics on the station across town, calling their request line to ask for the lamest songs they had and faxing continuous loops of paper so their machine would run out of fax paper over the weekend. All in 1992.

If we only knew

Five years later, that other station is now co-owned with yours and both exist in side-by-side computers in a rack somewhere. Both use automation software that costs less than \$1,000. You are doing production for one station, cutting news for another and acting as program director for the third. The former morning talent at your competitor is now selling projection TVs at the electronics superstore or has opened an "agency."

So much for five-year plans.

Obviously you are wondering how consolidation and downsizing will affect your job today or next week, but this might be a good time to fast-forward *another* five years just to plan ahead.

Will listeners get tired of hearing voice-tracked shows? Disembodied jock voices that continue saying, "What a nice day," long after the two-foot snowfall has abated, will not be terribly popular.

Where will the talent pool come from when the satellite-driven stations need to dip into it? Are you doing what you can to transcend the limitations of your station's format and become brilliant? Perhaps to *be* one of those satellite jocks heard on 500 stations?

You can do this without breaking stride or format: Diversify *off* the air. Everything you do away from the mic makes you a better performer when you are on it.

Learn to mix. Try your hand at home multitracking, and turn out your own songs.

Deconstruct a hip-hop recording and hear the elements that comprise it. These can be surprisingly simple to emulate on a home computer audio program and will train your ear to hear and recognize the rhythm within normal everyday sounds.

Become a better performer. If you are funny, try your hand at stand-up comedy. I went to high school with Carol Leifer and to college with Bob Nelson; she now has her own comedy series on the WB television network; he has been an HBO comic fixture for more than a decade.

Hard work pays off.

If you are more serious than funny, do legitimate theater. Read for your local SCA reader service to help the vision-impaired. Offer to participate in readings at those coffeehouse-bookstores found in every city. Narrate soundtracks for museums: I am certain my two-year old narrations for the Planetarium at the Pennsylvania State Museum are still in use.

Learn HTML, Java and all of those computer Internet languages and protocols your 11 year old already knows. These skills keep you in touch and up to date. Stations will want you to assist in website designs.

And today, right now, end your quest to be Stern, Imus, Don and Mike, Mancow,

Farrell, Zippo, Bubba, Moby et al., and begin to discover your own voice. These guys are already doing their act better than anyone could, and if a station wants them badly enough, they will get them.

The only way you can join the ranks of the greats is to be an original. Use your heroes as inspiration only. Cloning their acts will only hurt your career.

Empty studios

So what about that studio complex that now has seven stations under one roof? As soon as all the deregulation fun is over, what if Owner No. 10 decides to spin off or even surrender some of the licenses? What happens to all that pricey

gear and all that floor space now idled?

This may seem like a peculiar suggestion, but how about establishing a broadcast training facility? You have studios and gear, you need trained broadcasters for the future and you always are looking for non-traditional sources of income.

Find out about all the legal fluff and accreditation now. Make your facilities available to the communications departments of local colleges. In five years, it may prove a wise move.

This doesn't make answering the interview question about your five-year plan any easier. In light of developments over just the past two years, however, it may not be as weighty a question to ask as it once was.

If radio stations could talk and you were to ask one in 1992 where it thought *it* would be in five years, I bet it would not have known what to say, either.

ABSOLUTELY NOTHING.

Nothing at all.



Exactly what our new DSTL does to your audio. **Absolutely nothing.** The new digital DSTL featuring the Dolby® AC-2 Digital Audio System. So robust that if it's not the best sounding STL you've ever heard, we'll take it back, no questions asked.

Its digital audio coding and modulation schemes assure that your audio comes out exactly the way it went in. For more information, contact Broadcast Electronics at 1-800-4STL-RPU or at www.bdcast.com/dstl.

Isn't it time you invested in something that does absolutely nothing?



BE® **BROADCAST ELECTRONICS, INC.**
THE WORLD'S RADIO COMPANY

4100 N. 24th Street/P.O. Box 3606/Quincy, IL 62305-3606/(217)224-9600/Fax: (217)224-9607
 Internet: <http://www.bdcast.com> • E-Mail: bdcast@bdcast.com

PRODUCER'S FILE

dbx 286A: Big Bang, Few Bucks

Ty Ford

I was not expecting to enjoy my time with the dbx 286A mic preamp/processor. Frankly, at \$349.95, I was expecting a couple of rubber bands, a lot of plastic, string and a pair of Dixie cups. I was wrong.

Affordable

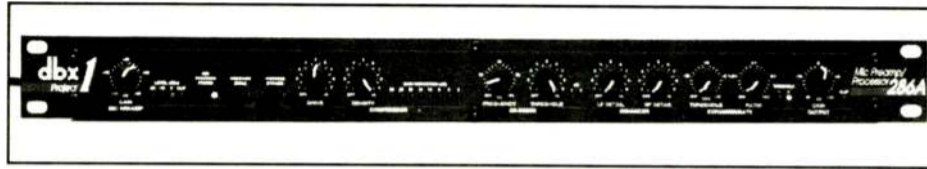
Actually, I have been waiting for the price of 1RU mic processors to take a tumble. While the rest of technology had been dropping in price, they had been gradually drifting up past the \$750 mark, with some as high as \$1,250.

The Rane VP12 (\$599) was the first significant shift in the price/performance ratio and the dbx 286A beats that price.

What we have here is a mic pre/line-

effects can be switched out of the circuit as a group or turned off individually with the effects bus in. The order of the effects can not be changed.

There is also an unbalanced TRS



The dbx 286A Mic Processor: Prices Keep Falling

level input with switchable phantom supply, compressor, de-esser, enhancer, expander gate and output control. The

insert point if you want to add your favorite outboard pieces to the chain. The insert point is between the preamp

Scott Studios' Breakthrough: Uncompressed Digital Audio at a Compressed Price!

Your station can make the quantum leap to *uncompressed* digital music from hard drives! *You'll hear the difference* in quality from this superior system!

Best of all, Scott Studios' *killer* new linear audio *costs no more* than compressed systems! Scott Studios is the *only* company playing *four* great sounding *uncompressed* digital stereo streams at 24kHz, 32kHz, 44.1kHz, 48kHz or any mix *with overlap* and *while recording!* No other system uses the sizzling hot new Motorola 56301 DSP chip and *32-bit PCI bus* audio cards! *Only* Scott Studios' system prevents dueling algorithms and eliminates compression artifacts with linear audio *at no extra charge!*

You also get a fail-safe watchdog for *unequaled* reliability, a 6x6 preview switcher that lets you hear ends of spots or songs while the middle is on-the-air, superior headroom, General Purpose Interface, digital ins and outs, optional timing stretch & squeeze, optional MPEG or APT, and more.



Scott Studios exclusive new 32-bit PCI audio card plays up to four CD quality uncompressed stereo channels while recording!

and the processor sections. All rotary pots are multiple detent pots, which help you get back to exact previous settings.

The front panel offers a detented rotary Mic Gain knob with a +10 to +60 dB range. Following it are four input level LEDs (-20, -10, 0 and Clip). Next is a pushbutton On/Off switch for the phantom power and a yellow LED to let you know it is on.

Following that is a high-pass filter that drops everything below 80 Hz at 18 dB/octave. The Master Process Bypass button and a red LED are next.

The compression section is next. A Drive pot pushes the input of the compressor and a Density pot controls the release time. To the right, an eight-segment LED reads gain reduction from 3 to 30 dB.

The De-esser is next with Frequency Selector and Threshold pots as well as 1 dB and 6 dB LEDs to indicate the amount of de-essing.

The Enhancer section follows with (LF) Low Frequency and (HF) High Frequency Detail pots. The LF Detail boosts 80 Hz while simultaneously cutting at 250 Hz. It is a nice idea that gives you bottom without as much mud. It gives most mics that bottom that sounds like an RE20, but beware; it can be overdone.

HF Detail, some sort of spectral enhancement, is next. High frequencies are extracted from a dynamic filter and are reinserted at a corner frequency starting around 400 or 500 Hz to 1.5 kHz, depending on the input. If the level is lower, the frequency changes very slightly.

I'm here to tell you this can make you sound *really* bad if you overdo it.

The Expander/Gate section offers Threshold and Ratio (1.1 to 10:1) knobs. It is designed well enough to be adjusted to remove room ambience smoothly across inhales during spoken-word recording. Push it too hard or use too much compression and the expander sounds a bit ragged around the edges.

Finally, the Gain for the effects section lets you tailor the gain of the processing section. That particular gain stage is part of the processing bus and is out of the line when the process section is in Bypass mode.

How it sounds

During my voice tests with a Gefell UM70 and Neumann U89, I was surprised at how good the 286A mic preamp sounded.

In a later session I used the 286A to record a D28S Martin with a U89, with equally good results. It was slightly brighter with a little less "meat" than my high-priced, top-shelf preamps, but embarrassingly close to them in quality.

The SSM 2017 chip used as the main mic preamp stage in the dbx box is a staple of the industry, but not known for exemplary performance. To get answers, I called dbx and spoke to hardware engineer Eric Johnson.

"We might've biased the 2017 chip a bit differently," said Johnson. "If you try to get 60 dB of gain, the chip becomes unstable, so we backed off a hair. We also spent a lot of time with layout, finding the worst and best possible places for each component. It took several prototypes to get things as

See DBX, page 35 ►

Good Spot Box



Scott's new digital Spot Box triple-deck "cart" replacement delivers awesome *linear* CD quality sound.

Spot Box is the *easiest* digital system to use! There's only one screen, so your jocks always know what's happening. At the left, three players give you legible labels, countdowns and End-of-Spot signals, with big well-lit buttons that show what's playing. Even though it uses Windows 95 or NT, Spot Box works like carts, *not* a computer. At right, there's a "rotary cart rack" that lets you pick and play any recording by number or name. Or, number keys at the bottom load your cut quickly.

As options, Spot Box can automatically load logs from traffic by diskette or LAN. You can record spots and edit phone calls at the right of the screen. Starting at \$5,000, Scott's Spot Box is so affordable many stations can even put two in an air studio for redundancy.

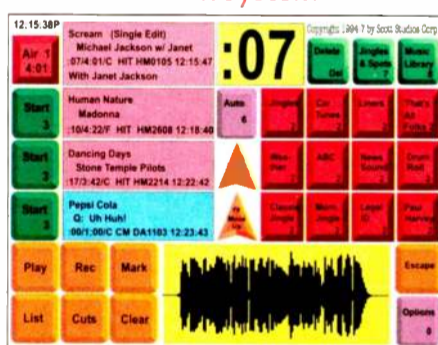
Better AXS



AXS[®] (pronounced ax'-cess) is radio's premier digital audio system for satellite or news/talk formats, CD automation and cart replacement for live jocks. AXS[®] gives you instant play Hot Keys, log editing, music on hard drive, Power Fill, satellite jock substitution, link to NPR's SOSS, an easy-to-use Real Time Scheduler, the industry's simplest and best net catcher, and an optional production or phone recorder and editor in the air studio.

Scott Studios offers AXS[®] satellite systems as low as \$7,500 complete. With Spot Box, AXS[®] or a Scott System, you can get 24 hour, 7 day support from Scott's 45 person staff—the biggest (and best) in digital audio! With several of these systems, any can record a spot once for all! Also, for spot or music on hard drive with typical playlists, you choose whether to get *uncompressed*, MPEG or APT digital audio cards at no difference in price.

Best Scott System



The Scott System is radio's top-of-the-line for digital music on hard drive. You get instant play Hot Keys, touch screen music libraries for instant requests, log editing, built-in phone recorder, pre-recording Voice Trax in context, and production that imports from any WAV digital multi-track.

Scott also offers an *invincible* seamless redundancy option. It's self-healing, so regardless what happens, your spots and hits just keep on comin'!

Good. Better. Best. Scott Studios' three digital systems can be tailored to *your* needs and budget. Call or E-Mail info@scottstudios.com for details.

Scott Studios corp.
 13375 Stemmons Freeway, Suite 400
 Dallas, Texas 75234 USA
 (972) 620-2211 FAX: (972) 620-8811
 8 0 0 7 2 6 8 8 7 7
(800) SCOTT-77

Circle (89) On Reader Service Card

► DBX, continued from page 34

clean as possible. Originally, there was some switching noise way down in the noise floor when the compressor was on."

Johnson noted that the compressor circuitry in the 286A is designed by Bob Orban, and while different than that used in the dbx 166, is the same style as their 168A compressor/de-esser unit, also an Orban design.

The only problem I had with the unit was a low-level buzz that came as the LF detail knob was raised. The buzz was audible when the LF knob was between 7 o'clock and 4 o'clock, but very audible when the effects chain was engaged with the gate closed or the input gain control was turned way down.

With a decent input level, the buzz was so low it could go unnoticed. When I mentioned it to Johnson, he called me back, verifying that he had heard it on a unit there and would look into it.

Having recently traded my classic RCA 44B ribbon mic for a Neumann U 89, I am now using my Clarence Kane-rebuilt 77DX to torture-test visiting preamps. The 286A did okay, but there was significant noise by the time I got enough gain out of the preamp to get the low-level 77DX up properly. The last three clicks of the mic gain pot bring up large amounts of noise, too much to be really useful.

Conclusion

The four-language manual — French, German, Spanish and English — is simple, explains the controls well, offers suggested settings for a variety of applications and does not include any schematics. The 286A is a well-designed piece that equals or exceeds the performance of more costly devices of its type. Nice job, guys.



For information, contact dbx in Utah at (801)568-7660 or circle Reader Service 19.

Ty Ford is the author of "Advanced Audio Production Techniques" and can be reached at tford@jagunet.com

Developments in 4x CD Recording

► CD-R, continued from page 32

unit performed flawlessly.

Did 4x recording demand more data throughput than the rest of the system could provide? After considerable troubleshooting, the problem turned out to be software-

'Smart' drives hold off doing thermal recalibration until a CD burn is complete.

related, quickly fixed by downloading a patch off the Internet.

With this glitch past, the CDR400t operated well on both "legacy" 486 machines and Pentiums.

Computer processor speed is not important here. The only key hardware requirement is that you have a fairly recent hard drive — Ultra SCSI or EIDE. These "smart" drives hold off doing thermal recalibration until a CD burn is complete. Thermal recalibration interrupts data flow, causing buffer underruns.

With 2x CD-Rs under \$400, expect to pay twice that for 4x capability.

A workstation burning an audio CD must be dedicated to the task. Forget multitasking except, perhaps, with the most sophisticated (and costly) systems.

If you anticipate making several CDs each week, the Yamaha CDR400t makes good time-management sense: A full CD can be recorded in slightly more than 30 minutes at 2x, but a 4x drive cuts that in half.

When account executives arrive with last-minute spots just after you have started a full-length recording session,

that brief wait is bearable. The prospect of a half-hour downtime means you might have to trash the project.

Is it worth waiting for the "next wave" before investing in the technology? The CDR400t may be the highest-performance CD-R likely to be made. Drives running at 6x will appear, but likely will be prohibitively priced and geared more towards the replicator market. But that does not mean additional features are not forthcoming for 4x.

Cut it again

According to Dan Baca, national sales manager/product manager for Yamaha Systems Technology Inc., nearly all CD-Rs will be augmented with re-recordable functionality by mid-1998. By the time you read this, the next development in the Yamaha product line — the

CRW4001t — may be available.

"We're not even going to call it a re-recordable drive," Baca said. "We're going to call it a 'multi-function' drive."

This technology will not make the record-once CD obsolete. Baca expects the new drive to be used as a CD-R up to 90 percent of the time.

"You're only going to use a rewritable disc when you want to back-up your system or do multiple revisions of a presentation," Baca said. "When you finally get it right, you cut it to a CD-R disc."



Carl Lindemann produces the syndicated radio show "Cyberscene" and manages its supporting website: www.radioshow.net

His most recent RW article on recordable CD technology profiled the Sony CSP-960H drive.

The DVD Connection

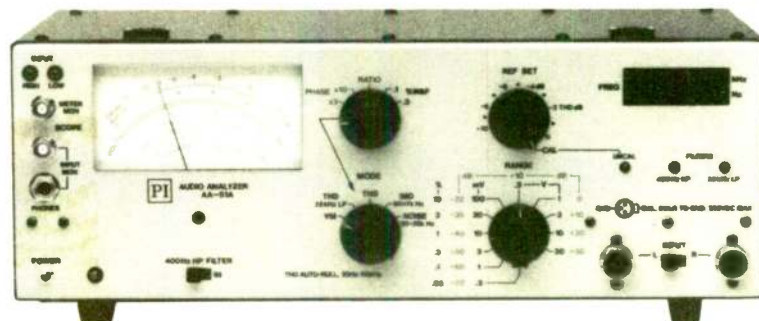
Multifunction drives should hold the market until 2000, when rewritable digital video disc (DVD-RW) is anticipated to surpass it in popularity. The DVD-RW will be fully backward-compatible with CD-R, CD-ROM and CD-RW.

The changeover in the marketplace to multifunction units will follow a familiar pattern. As multifunction CD-RW becomes a standard, Baca anticipates drastic price drops with today's CD-Rs appearing at discounters and liquidators.

Typically, top-of-the-line units like the CDR400t are the last to go at deep discounts, so if you are holding off on price, you will be holding on for a while.

If you do decide to take the plunge now, it may be worth paying a premium on top of the premium to get the CRW4001t. Whichever way you go, 4x CD-R/CD-RW will support your production needs well into the coming DVD era.

AA-51A AUDIO ANALYZER



MEASURES:

- HARMONIC DISTORTION
- VOLTS
- dB; dBm (600 ohms)
- FREQUENCY
- WOW & FLUTTER
- STEREO PHASING
- SIGNAL + NOISE NOISE
- INTERMODULATION DISTORTION
- DIFFERENTIAL GAIN OF STEREO CHANNELS

FEATURES:

- AUTO-NULL THD+N
- SHIELDED & BALANCED STEREO INPUTS
- COMPATIBLE WITH NAB TEST DISKS
- FREQUENCY READOUT
- SWITCHABLE HIGH-PASS AND LOW-PASS FILTERS
- VERNIER SET-LEVEL CONTROL
- HEADPHONE INPUT
- MONITOR PORT

<http://www.pi-usa.com>

PLEASE CONTACT US FOR COMPLETE DETAILS

get
Connected fast!



If you demand the highest quality, competitive pricing and the quickest turn-around time of Audio Patch Panels in the industry, then Gentner Communications speaks your language. Gentner offers all these features, plus a variety of configurations to meet your exacting needs. So start getting connected, and call us today!

800.933.4804

Gentner
We put the world on speaking terms™

801.975.7200

<http://www.gentner.com>

Try our conference calling service, 1-800-LETS MEET



Potomac Instruments, inc.
932 Philadelphia Ave., Silver Spring, MD 20910
Phone 1-301-589-2662 • Fax 1-301-589-2665

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

Composite Audio DA and Switcher!



The CDS-200 Composite DA/Switcher

APPLICATIONS

- Switching Between Composite STL's
- Main/Alternate Processing Switching
- Feed Two Transmitters and an RDBS Encoder
- Feed one SCA Generator to Two Transmitters
- Distribute Composite with the Ease of Audio

FEATURES

- 2 Input Switcher
- 3 Isolated Outputs
- Individual Level Control for Each Output
- Front Panel and Remote Control with Full Status
- Power Fail Memory with Bypass Mode
- Inputs Selectable for Balanced or Unbalanced Operation
- Front Panel Test Jack



Broadcast Devices, Inc.
5 Crestview Avenue, Peekskill, NY 10566
broadcastdevices@worldnet.att.net

Tel: (914) 737-5032 FAX: (914) 736-6916

READER SERVICE NO. 39

Radio's Best Kept Secret

Radio's most-passionate listener listens to Christian music.



Arbitron proves it...
Reach Radio Network delivers it.



From Music City USA,
Gospel music's preeminent programming service,
Reach Radio Network brings you:

- ◆ Satellite-delivered live programming
- ◆ CD-delivered syndicated programs



Reach Radio Network

220 Great Circle Road Ste 132 Nashville TN 37228

800-742-3969

GOSPEL MUSIC'S PREEMINENT RADIO PROGRAMMING SERVICE.

READER SERVICE NO. 78

In a Competitive World,
You Have to Work Hard to
Attract and Keep Your Listeners.
Coverage Counts.
You Can Count on Shively!

- 30 Years Experience
- Full-Service Provider
- Multi-Station Solutions
- FM & UHF Antennas
- Filters & Combiners

Shively Labs,
because ...
... it pays to be heard!

P.O. Box 389, Bridgton, ME 04009 USA
Tel.: (207) 647-3327 FAX: (207) 647-8273
Visit Our New Web Site: www.shively.com
- An Employee-Owned Company -

READER SERVICE NO. 77

S.C.M.S., Inc. Charlotte, N.C.

Low Prices - Experienced Staff
New and Re-built R.F. and Audio

THIS MONTH'S SPECIAL

>> **NEW FROM S.C.M.S. <<**
20' TELESCOPING MAST
FOR REMOTE PICKUP
ONLY \$795.00
CALL FOR MORE INFO

You Know We Know Radio —
Toll-Free 800-438-6040
FAX 704-889-4540

READER SERVICE NO. 38

Buy simplicity,
reliability and service

EAS

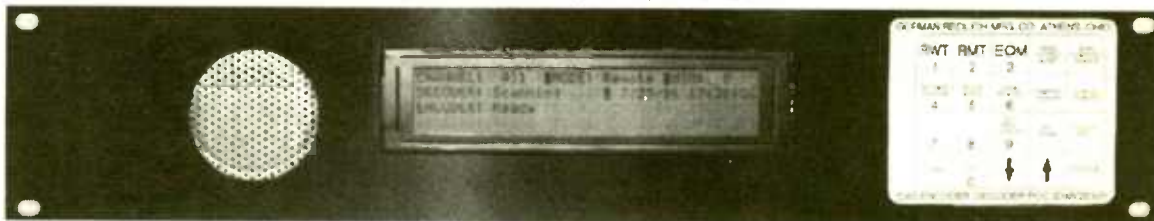
Price \$1750.00

Equipment required for
F.C.C. Jan. 1, 1997 deadline

Phone 614-593-3150

GORMAN-REDLICH MFG. CO.
257 W. Union St. Athens, Ohio 45701

FAX 614-592-3898



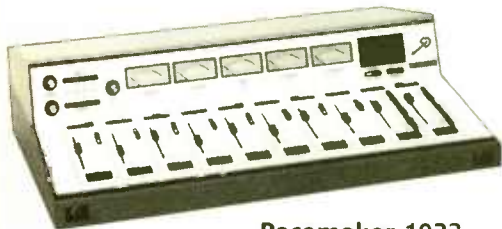
- 5 two-way RS-232 inputs/outputs for computer, remote signboard & character generator
- 4 audio inputs on standard models (expandable to 6 audio inputs). All audio inputs & outputs are transformer isolated from encoder-decoder board.
- Automatic interruption of program audio for unattended operation.
- 4 line 40 character LCD display with LED backlighting
- 20 key keypad to program unit, set modulation level, set input levels
- Will handshake with automation equipment.
- 2 year warranty
- 2 minutes of digital audio storage (expandable to 4.5 minutes)
- 25 pin parallel printer port for external printer
- 52 terminals on the rear to interface with other equipment by removable plugs.

Web Site: www.gorman-redlich.com

◆ Also available: printers, weather radios, antennas for weather radios, crystal controlled synthesized FM digitally tuned radios, remote signboards, cables for interconnection, character generators.

READER SERVICE NO. 117

A Perfect AUTOGRAM Combination



Pacemaker 1032

Pacemaker
RTV
Mini Mix
?



Solution 20

Console Accesories All In ONE Package:

Distribution Amp Card • 10 Watt Stereo Amp Card
Relay Card • Microphone Processor Card

AUTOGRAM
CORPORATION

Plano Texas
1-800-327-6901 FAX (972) 423-6334
E Mail: info@autogramcorp.com
www.autogramcorp.com

READER SERVICE NO. 116

Eliminate Interference!

Eliminate Out-of-Band Interference at your C-Band Receive Antenna



The model 7892 bandpass filter suppresses interference caused by radar systems.

For more information on interference filters for C & Ku-Band request our catalog **TVRO Vol. 1 No. 4.**

Toll Free: 800-448-1666
(315) 438-4700
Toll Free Fax: 888-411-8860

MFC
Microwave Filter Company, Inc.
6743 Kinne Street
East Syracuse, NY 13057



Photo of 7892's mounted between antenna feed and LNA's (both Vertical and Horizontal Polarization).

READER SERVICE NO. 37

PRODUCT EVALUATION

Mastercom Works at World Cafe

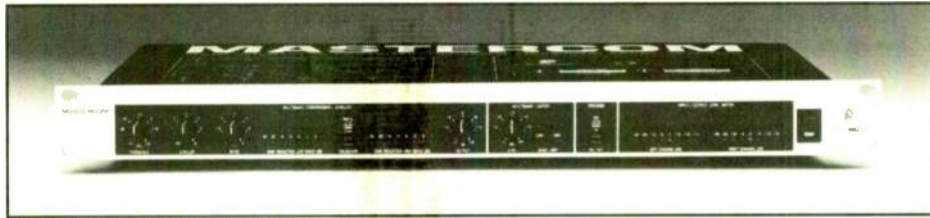
Tom Vernon

There is a corollary of Murphy's Law just for audio engineers that states: No matter how many limiters you have for a recording session, there are never enough.

So it is at the studios of the World Cafe, a nationally-syndicated program that showcases singer-songwriters over Public Radio International. Our rack of LA-4 limiters always is used up, and a few sources must be left unprocessed. So we were happy to receive a Behringer Mastercom MDX 4000 compressor/leveler/limiter for review.

indicate activity of the respective limiters. Eight-LED indicators are used to display input/output levels and gain reduction.

Around back, the Mastercom is equally simple. Quarter-inch TRS plugs and XLR connectors are all there is.



From Europe, the Behringer Mastercom MDX 4000 Compressor/Limiter

The manual is well done and worth a serious read. The Mastercom comes with a reassuring 5-year warranty.

Construction

The overall quality of construction of the MDX 4000 is quite good.

Sheet-metal work is solid. The audio circuitry is on one board, and its construction and assembly looks pretty neat. A toroidal power transformer is used; smaller than a conventional power transformer, it means a resultant reduction in the size of the unit and a lower hum field.

The operating manual goes beyond the obligatory brief description of controls, specifications and operating instructions. The Applications section offers a wealth of generic background information on processing.

There are specifics on using a limiter for recording and cassette duplication, as a protective device for speakers in a sound system, to prevent saturation with analog tape recorders, for processing in AM, FM, and TV air chains and in telephone and transmission chains.

The manual also contains a section on

Theory of Operation, where several of this limiter's nifty features are described. Here is where to find information on the electronically servo-balanced inputs and outputs, the special BE027 and BE037 op-amps developed by Behringer and the Interactive Gain

Control (IGC) peak limiter, which intelligently combines a clipper and limiter.

As with the Behringer Eurorack mixer we looked at recently (RW, Sept. 3), there is no mention in the manual of a domestic distributor for tech support or warranty repair work.

I will let you in on a secret: Samson Technologies in New York is the American representative for Behringer, and their number is (516) 364-2244. Don't tell anybody.

The MDX 4000 has a frequency response of 5 Hz to 100 kHz. Distortion at +4 dBu typically is 0.02 percent. At +20 dBu, distortion is spec'd at 0.1 percent.

Intermod distortion by the SMPTE method is 0.01 percent at +10 dBu.

Splitting bands

At unity gain, noise and hum are down -93 dBu (20 Hz to 20 kHz, unweighted). Maximum output level is +26 dBm into a balanced load.

From a user perspective, the Mastercom is straightforward to operate and a fun piece of equipment to play with. The detented controls have a nice feel.

Part of what gives the Mastercom a unique sound is its dual-band processing. The MDX 4000 is a good compromise between broadband and multiband processors.

Broadband processors like the LA4s we use leave the spectral balance of the music intact but may be easily overloaded if a signal has a heavy low frequency component, such as drums or bass guitar. In that case, the excessive low frequency notes from these sources will control the gain reduction for the whole spectrum, and "suck down" vocals or other instruments. The technical term for this effect is *spectral gain intermodulation*.

Multiband processors usually split the audio spectrum into three or more bands, each with its own compressor and/or limiter. The discrete bands are recombined to a single output. These are immune to spectral intermodulation, but may have other problems.

See MASTER, page 42 ▶

Just one look

On the outside, the Mastercom is a sleek 1RU brushed aluminum box. Front panel controls include an In/Out switch that controls the relays for both channels.

When the switch is in the Out position or the power is turned off, the input-to-output connections are direct. This enables users to make A/B comparisons between processed and unprocessed signals.

The Threshold control sets the threshold point of the compressor/leveler within the range of -40 to +20 dBu. A Leveler control is used to mix in the leveler function, and a center-detented position is recommended for most applications.

A Ratio control is used to adjust the ratio between input and output level for all signals exceeding the threshold point. The Crossover switch lets you select 500 Hz or 2 kHz. For complex signals, Behringer recommends 500 Hz; for vocals or individual instruments, 2 kHz.

With the Output control, you can boost the output signal by as much as 20 dB to compensate for processing losses. The Level control sets an amplitude "brick wall" that lets nothing get by.

Separate LEDs for high and low bands

The Wizard™ has gone STEREO!

The new DIGITAL FMSA-1 gives The Wizard System unmatched stereo monitoring capabilities. . .

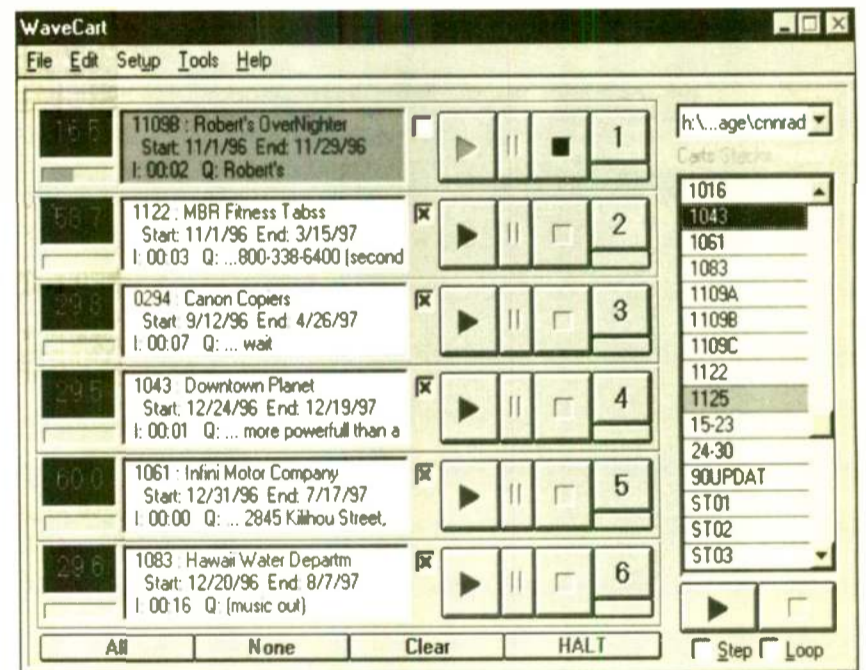


Superlative stereo performance. Linear-phase filters that reveal the true performance of your audio processing. The stability of digital stereo demodulation. The sophisticated graphical presentation of The Wizard. And—with the RS-232 port—operation on site or off.

Contact Belar today for more details on what should be your next modulation monitor

BELAR ELECTRONICS LABORATORY, INC.
119 LANCASTER AVENUE • P.O. BOX 76 • DEVON, PA 19333-0076 USA
(610) 687-5550 • FAX (610) 687-2686
Call, write or FAX for more information on Belar AM, FM, Stereo, SCA, and TV monitors.

On-Screen Cart Machine



Yes... it's true. An easy-to-use on-screen digital cart machine that runs on a regular PC. WaveCart uses standard or compressed WAV files. Thanks to our exclusive RapidFire® technology, playback is instantaneous. Rotating cart & overlap capability. WaveCart comes with its own digital audio editor. Up to ten on-screen decks. Windows 3.1 or 95.

24 HOUR FREE TECH SUPPORT

888-BSIUSA1

Only \$249

Try Before You Buy.
Download the Actual Software!
www.bsiusa.com

BSI
Broadcast Software International

DAR Sabre Plus: DAW From England

Keith Spencer-Allen

Since 1988, Digital Audio Research, based in the United Kingdom, has specialized in digital audio workstations with a difference.

Until recently, DAR has not had a huge presence in the United States, but sharing booth space with AMEK at last month's AES Convention in New York gave the company some much-needed exposure.

With dedicated control surfaces, operation-oriented touchscreens and DSP functions slightly ahead of other manufacturers, DAR set the pace for a range of upscale digital systems.

Then, in 1992, DAR launched Sabre, a workstation that adapted much of the proven style of existing DAR systems, but based around a magneto-optical (MO) drive, a smaller dedicated control surface and a standard color monitor.

Three years later, the company introduced Sabre Plus, which, among other improvements, added an optional hard drive in addition to the MO disk for storage.

Present day

Now DAR is out with a major software upgrade to the Sabre Plus.

Physically, the system looks diminutive. There is a compact controller with several rows of buttons, two rotary controllers, a single fader, a high-resolution

color monitor and a mouse. The actual electronics are out of the way, in a rack.

The Sabre Plus is operated via a mix of dedicated controls on the console, a mouse to select on-screen soft keys or the supplied QWERTY keyboard for specific key functions.

Since early this year, the Sabre Plus has shipped with removable 2.6 GB MO disks that replay eight tracks simultane-

The Sabre can look to see what material is available on the network.

ously and record up to four tracks at one time. New disks are being tested, which may increase this to eight simultaneous recording channels.

The Sabre Plus software upgrade is known as the Open Media Release. All storage media are now DOS-formatted and audio is recorded in standard WAV format.

Networking capabilities have improved. In the future, the Sabre will be able to take advantage of third-party advances.

In use, most functions of the Sabre

Plus can be conducted from the single screen display. The central area of the screen is dominated by a piece of eight- or 16-track virtual "tape."

Audio can be copied from any of three directories at the top of the screen, or recorded directly into the system.

The simplest recording option assumes that the necessary system inputs have been assigned. The desired tracks can be armed and the Autorouter intelligently sends the inputs to the required tracks.

If the inputs are not already assigned, the Record page provides metering and control options, such as different threshold settings.

The virtual tape may be controlled through dedicated transport controls or scrubbed with a large jog wheel. Colored icons on the left side show track settings.



DAR Sabre Plus

Tracks can be routed as desired, and two Auxiliary sends and six Return sends are available for effects and cue routing. The user can create an internal stereo mix.

Everything on the left side of the screen is referred to as the Global Mix. The user can deselect segments from this default mode and assign different parameters to them, such as routing and EQ.

Processing includes Pan, Gain, four-band Parametric EQ with A/B settings and ± 31 dB gain. All EQ settings can be stored as templates.

Down to business

Editing options on the Sabre Plus are extensive. In its simplest mode, editing is much like many popular PC-based workstations. Highlight the desired audio segment, then select the Trim function and work on the in- or out-point.

Trimming is accomplished by the use of the rotary control, the step size of which is determined by the zoom ratio. The smallest resolution for editing is four samples.

The new software adds "audible edit" features that include the ability to make more use of the scrub feature, not only to position an edit point in a file, but also to hear where you are trimming.

The new Slide feature also uses the Vernier control to slide an edit point between two pieces of audio without actually moving the audio. Slip allows a piece of audio to be moved against a

"Now-line" or sync point.

It is now possible *automatically* to fill gaps between segments with identified sections of longer audio items without the need to pre-edit or calculate timings. The Timewarp feature and Varispeed can be used to fit a longer section to the selected gap.

Other new features include the ability to reverse segments for backwards playback and on-the-fly sample-rate conversion during the copy process from source to project.

Crossfade edits are simple to execute. Highlight a segment, select the Xfade key, lock in the in/out points and select a crossfade curve with a time value and the crossfade is set.

There are many aids to perfecting the edit, including multiple repeats sections and play-from/play-to functions.

Another benefit of the new software is its networking enhancements. The Sabre can look to see what material is available on the network for DAR-compatible devices and then play, scrub and — if desired — edit without copying the file to the local machine.

Smart copying

If a local copy of a file is needed, the software performs *differential* copying: It checks to see if an original WAV file is on the destination disk. If it finds one, it does not bother to copy the audio but just creates a new segment file.

With the new software, you can create projects from multiple reels within the playback sequence, then bundle them as a single project. These can be from the same or different drives, but can be used either concurrently or following each other.

What does this mean to the radio production person? Different sections of a program might be prepared on different machines and assembled within a single Sabre for playback.

Radio production in the United States has not embraced magneto-optical technology fully. But the MO disk approach of the Sabre Plus is handy for easy changes among projects, while the hard disk would be ideal to store an effects and music library.

In terms of speed for everyday applications, there are few obvious differences between MO and hard disk other than the number of simultaneously available tracks.

For those who are not familiar with DAR products — specifically the upgraded Sabre Plus — now is a good time to look into this workstation. The facilities offered have increased dramatically over the years, and a strong case could be made for its use in both small facilities and larger networked environments.

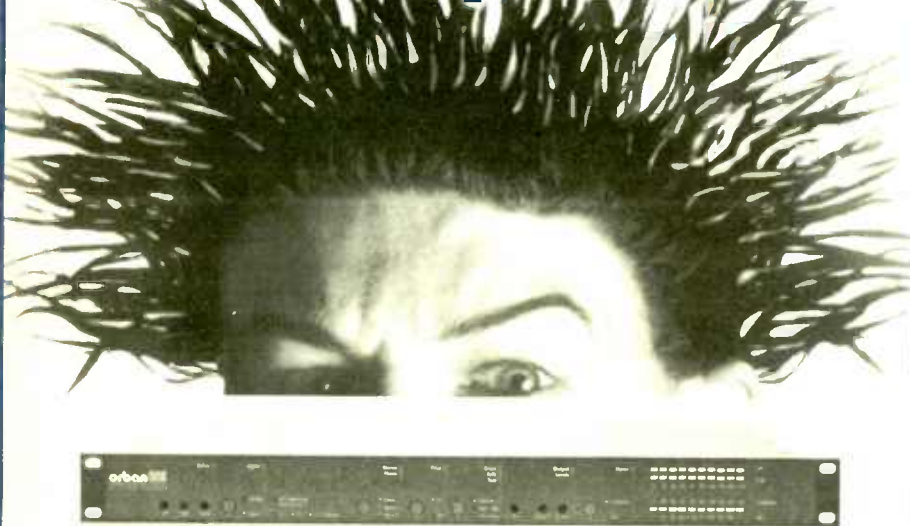
DAR ships direct from the United Kingdom, but the company is seeking a dealer in the United States for the Sabre Plus.

■ ■ ■

For information on DAR products, contact Joanne Thomas in England at 011-44-1372-742848; Fax 011-44-1372-743532 or circle Reader Service 10.

Keith Spencer-Allen is a freelance consultant and recording engineer based near London.

Stereo encoding, now with peak overshoot protection.



You want maximum loudness, top digital performance and long-term stability for FM broadcast — all with no artifacts. Choose the stand-alone 8218 stereo encoder/generator.

Your audio will be encoded in the digital domain by dedicated DSP and protected with a built-in patented limiter that controls hair-raising overshoots.

For details, contact your Orban representative.

orban
A Harman International Company

1525 Alvarado Street, San Leandro, CA 94577 USA

Phone: (1) 510/351-3500 Fax: (1) 510/351-0500 Internet: custserv@orban.com Website: www.orban.com

Circle (51) On Reader Service Card

Harris DIGIT® CD Digital FM Exciter



World's Best Digital FM Exciter.

DIGIT® CD, our second generation digital FM exciter, continues the proud tradition started in 1993. There are now over 1200 DIGITS on the air throughout the world. Others may offer digital exciters but DIGIT® CD remains the broadcaster's choice with the world's best performance and a long history of on air service with tens of millions of broadcast hours. No one else even comes close.

DIGIT® CD converts studio standard digital audio (AES/EBU) directly to FM stereo with no analog steps. Direct Digital Synthesis is important for true digital generation. It is accomplished with a numerically controlled oscillator (NCO). With NCO digital generation of FM you are assured of the highest quality sound that your station is capable of producing.

DIGIT® CD has an analog input module for those who haven't converted to digital yet or a digital input module. For those thinking of a complete digital upgrade, Harris can supply our CD LINK™, 950 MHz uncompressed digital STL, to complete a 100% digital path.

DIGIT® CD's digital input module uses a DSP based digital stereo generator which provides transparent audio and

maximum separation. Also, included is a digital composite limiter (DCL) which is an implementation of the WAVES L1 Ultra-Maximizer™, used by digital recording studios. Harris exclusive DCL allows DIGIT® CD to sound louder than competing FM exciters without overmodulation. The DCL uses "look ahead" circuitry to predict and correct overmodulation peaks before they can occur.

DIGIT® CD Features:

- **New Benchmark for digital exciter sound quality**
- **New GPS Lock Option for FM synchronous broadcasting**
- **New Synchronous AM noise reduction circuitry**
- **Proven Reliability backed by a 3-Year Warranty**
- **DDS NCO FM Generation for Maximum Sound Quality**
- **Immunity to Subsonic Transients**
- **Compatible with all RDS/SCA requirements**
- **Frequency Agile with N+1 capability**
- **Manufactured under ISO 9001 Quality System**

DIGIT® CD is capable of N+1 operation because it is frequency agile with modulation level and linearity independen-

dent of carrier frequency. This is an especially important feature today with consolidation of FM sites. N+1 installations would allow one spare transmitter to be substituted for any other FM transmitter at the same site.

Besides the DIGIT® CD, Harris has a wide range of "Clearly Digital®" products for all your broadcast needs whether AM, FM or TV.

Harris Platinum Z transmitters feature DIGIT® CD exciters, a great combination!



Harris Corporation Broadcast Division
U.S. and Canada
TEL: +1 217 222-8200
FAX: +1 217 224-1439
Elsewhere
TEL: +1 217 222-8290
FAX: +1 217 224-2764

<http://www.broadcast.harris.com>



A new world of broadcast solutions

© 1997 Harris Corp.

NEW !!!

Trak*Star III-

**4 x the power
& On Sale !!!!**



- **The #1 selling Trak*Star II has a NEW big brother !!!**
- **Trak*Star III has 4 times the power of Trak*Star II with...**
 - **Real time fade**
 - **Effects bus**
 - **New screen design**
 - **Edit & assemble files up to 6 hours long**
 - **many other powerful new features.**
- **Complete backup capability for your On Air Digilink**
- **Trak*Star III now comes with a 1.2GB drive standard**

Trak*Star III is a *NEW* multipurpose digital audio workstation for multitrack mixing and editing. Fully compatible with the #1 selling and industry standard Digilink & Trak*Star II, the Trak*Star III has four times the raw processing power of the Trak*Star II with many new features that utilize this remarkable new power... *real time fade, effects loop, 4 autolocator points, edit files up to 6 hours long, punch in-out, a 1.2GB drive standard, Digilink backup software, & 100's of others.*

Trak*Star, by Arrakis Systems, is the first cost effective multitrack digital audio recorder, mixer, and editor designed specifically for the radio broadcast professional. Also, Trak*Star is the only multitrack editor that is a complete backup to your Digilink on air workstation in every way right down to the audio routing switcher and control logic. More than just a digital editor, a Trak*Star digital workstation is a completely integrated digital solution that interfaces throughout your station to On Air, News, Editing, Traffic, etc. for transfer of digital audio, schedules, text, E-mail, and News wires.

With Trak*Star, creating spots, jingles, and liners has never been easier. Record and store on disk all of your standard music beds and sound effects. Select any combination of up to 4 stereo or mono sound files for editing and mixing. Once selected, you can easily scrub, cut, splice, copy, move, delete, fade, and mix any combination of these files to create your new spot or jingle. Record or overdub new voice tracks into the system while simultaneously playing back your preassembled mix. No matter how much you cut, splice, or throw away pieces of files... non-destructive digital editing leaves your original files unchanged. With Trak*Star you have unprecedented levels of control when you cut and splice by expanding tracks and actually working with the waveform itself. Trak*Star completely revolutionizes multitrack audio production for radio.



*The 22,000 series console can add even more functionality to Trak*Star by providing video & audio monitoring, plus audio input & output feeds*

Trak*Star is literally a complete multitrack studio in a compact box. As a radio specific product by Arrakis Systems, the Trak*Star works the way you do with the features and price that you need.

Call now to find out how this amazing new workstation can be made to work for you.

Sale !!!

TS3-600

\$5,995

(a \$7,995 value)

for more information call... (303) 224-2248

in some areas, call (970) 224-2248

#1 IN
STUDIO
FURNITURE

#1 IN
AUDIO
CONSOLES

#1 IN
DIGITAL
AUDIO

arrakis
SYSTEMS INC.

2619 Midpoint Drive, Fort Collins, CO. 80525
Voice- 303-224-2248, Fax- 303-493-1076

Audio Consoles

The stand out #1 leader in reliable, high performance, digital ready consoles for radio, Arrakis has several console lines to meet your every application. The 1200 series is ideal for compact installations. The modular 12,000 series is available in 8, 18, & 28 channel mainframes. The 22000 Gemini series features optional video monitors and switchers for digital workstation control.

1200 Series Consoles



1200-5	Five ch	\$1,795
1200-10	Ten ch	\$3,495
1200-15	Fifteen ch	\$4,995

12000 Series Consoles from \$3,995



22000 Series Consoles from \$6,995



Digital Workstations

#1 in digital workstation sales, Arrakis has over 1,600 workstations in use around the world.

As a multipurpose digital audio record-play workstation for radio, it replaces cart machines, reel machines, cassette recorders, & often even consoles. Digilink has proven to be ideal for live on air, production, news, and automation applications. Place a workstation in each studio and then interconnect them with a digital network for transferring audio, text, & schedules between studios. Arrakis is the #1 choice of broadcasters.

Satellite Automation



CD Automation



Use for Live On Air, Automation, Production, News & Scheduling



Digilink & Trak*Star Workstations

Studio Furniture

With over 1,000 studios in the field, Arrakis is #1 in studio furniture sales for radio.

Using only the finest materials, balanced laminated panels, and solid oak trim, Arrakis furniture systems are rugged and attractive for years of hard use.

Available in two basic product families with literally thousands of variations, an Arrakis studio furniture package can easily be configured to meet your specific requirement, whether it is simply off the shelf or fully custom.

Call Arrakis to find out how easy it is to design and build your next studio.

Desk*Star studio furniture systems



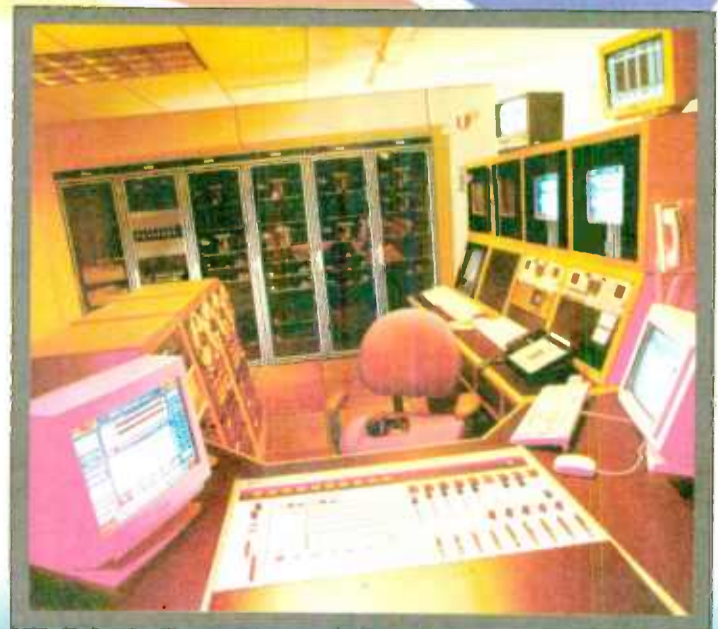
Modlux studio furniture systems

Complete systems...

As illustrated in the Sony Worldwide Networks master control studio on the right (one of seven Arrakis studios in the Manhattan, New York complex), Arrakis can provide complete major market studios with Arrakis consoles, digital workstations, video-audio switchers, furniture, and system prewiring.

With a choice of several console lines; digital workstations for live air, production, news, and automation; and two major studio furniture product lines, Arrakis can meet broadcasters needs from the compact news studio to the major market network origination center. Complete Arrakis equipped studios can be found around the world from Tokyo, to Moscow, to Japan, to Tahiti. Call Arrakis today for your equipment or studio needs,

Sony Worldwide Networks
Manhattan, New York



SHORT TAKE

Sony Deck Pulls Out All Stops

Alan R. Peterson

Are you ready to move beyond eight-track modular digital multitrack recorders? If you have a trust fund ready to cash in, here is a recorder that should interest you: the Sony PCM-3348HR digital audio recorder.

This digital reel tape recorder is the latest in the evolution of the PCM-3324 digital recorder Sony created in 1982 and an enhanced version of the PCM-3348 (the HR means High Resolution).

The PCM-3348HR provides 48 channels of 24-bit digital audio on standard half-inch DASH tape, 10.5- or 14-inch

reels. The high digital resolution makes the recorder immediately compatible with new 24-bit-capable digital consoles, such as the Sony OXF-R3.

The PCM-3348HR can be operated in 16-bit mode, making it compatible with current DASH recorders.

Audio interfaces include 48 channels of 20-bit A/D and D/A conversion, 48 channels of MADI digital I/O and eight channels of AES/EBU digital I/O. One-bit A/D converters with 64-times oversampling digital filters enhance sound quality for analog input signals.

An RS-422 nine-pin serial connector allows external machine control via

computer and an RM-3348HR remote control module with stand is also provided.

Two PCM-3348HR recorders are already in use at Ocean Way Recording, with facilities in Nashville and Los Angeles. While more appropriate for music recording and film mixing, the Sony PCM-3348HR is suitable for facilities doing critical long-form radio production and jingle/production music creation.

The PCM-3348HR is priced a lot higher than a garden variety modular multitrack. At \$300,000 list, this is a serious recorder meant for serious work.



Sony PCM-3348 HR Recorder

For information, contact Sony Electronics in California at (408) 955-5121 or circle Reader Service 49.

WORLD CLASS TELEPHONE REMOTES

MARTI



SMARTI

Using standard telephone lines, Smarti can send and receive 7.5 KHz audio for true broadcast audio quality. It's the first RPU

engineered from the user's point-of-view. And its built-in modem uses the fastest speeds available to ensure broadcast quality audio.

Cellcast Cellular Remote Broadcast Studio

MARTI'S new Cellcast remote broadcasting system eliminates line-of-sight requirements, phone line access, and antenna problems while reporting from the scene because the Cellcast is cellular - just turn it on and go.



MARTI

ELECTRONICS
World Class Performance • World Class Value

Box 661, Cleburne, Texas 76033 U.S.A. PH: (817) 645-9163 • FX: (817) 641-3869
www.marti.bdcast.com or e-mail: marti@bdcast.com

Riding Gain With Mastercom

► MASTER, continued from page 37

Adjustment of multiple controls for the desired sound is tedious and time-consuming. Consistency of sound between different sources is unlikely. A multiband processor also can alter the spectral balance of music and voice, resulting in an unnatural sound.

With its two bands and switch-selectable crossover, Mastercom can handle instruments with heavy bass content, without the difficulties of traditional broadband or multiband processors.

Several band managers asked how we liked it and indicated they have seen several in the field. I suspect it might find a better niche in the production room or broadcast processing chain.

Following the guidelines in the manual can yield impressive results. Breaking the rules can result in some interesting sounds. One of our producers was able to create a Phil Collins-esque drum effect after a little experimentation.

The one serious restriction of this limiter is that you cannot control the processing for each channel separately.

If you have drums on one channel and vocals on the other, the heavy compression of the drums also will reduce the gain for the vocals. This is the kind of special effect you usually do not want to create. Because there are few stereo sources in a live recording environment, this can be a serious drawback.

As always, a tip of the high hat to World Cafe producers Chris Williams and Joe Taylor who experimented with the Mastercom and were able to bring the sound if not the body of Phil Collins to our humble studios.

Tom Vernon divides his time between consulting and completion of a Ph.D. He can be reached by e-mail at TLVernon@aol.com or by calling (717) 367-5595.

PRODUCT GUIDE

Companies with new product announcements for Studio Sessions Product Guide should send them to:
Radio World, c/o Studio Sessions Editor, P.O. Box 1214, Falls Church, VA. 22041

Denon MiniDisc Deck

Denon Electronics has the new DN-M2000R MiniDisc player, based on the successful design of the company's DN-2500F CD machines.



The front panel contains the same familiar button arrangement as on Denon CD decks, but the transport is a single MD unit and the faceplate also includes a Record button. Up to 74 stereo minutes or 148 mono minutes may be recorded onto a single MD.

Five Hot Start buttons allow instant playback of songs or sound effects loaded into memory locations. Loop points can be placed during playback and the Seamless Loop feature can be executed even during a Hot Start playback.

As on the CD player, the Denon DN-M2000R has a large jog dial and shuttle wheel for fast, precise cueing. Up to five cue points may be written to memory. A Pitch slider may be set to either ± 4 or ± 8 percent of playback speed.

For information, contact Denon Electronics in New Jersey at (201) 575-7810 or circle Reader Service 166.

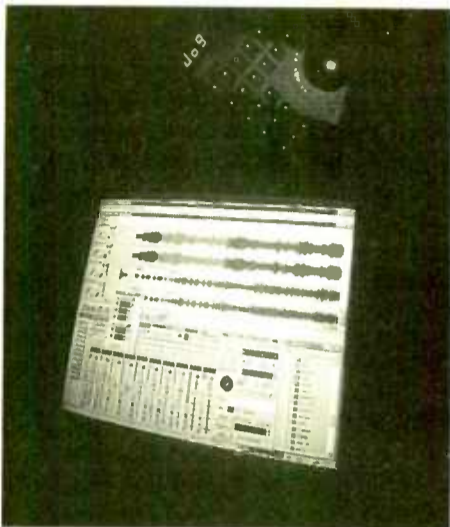
SADiE Software Revision

Version V3 software for the SADiE and Octavia Digital Audio Workstations is now available from SADiE, Inc.

The new software has been designed to work on both the SADiE and Octavia systems. A key feature is Dynamic Reallocation of DSP, which allows the AT&T digital signal processors found in both systems to perform real-time EQ and dynamics processing.

Audio Format Interchange (AFI) capability lets both systems read and

write all major audio formats, eliminating time-intensive file format conversions. The new software also supports the new Broadcast Wave Format (BWF).



For information, contact SADiE Inc., in Tennessee at (615) 327-1140 or circle Reader Service 205.

Sampling Tools from ILIO

ILIO Entertainment has products of interest to production people doing sound designing, sampling and music production.

A MIDI controller called the Digitar lets an audio engineer trigger samples from a device that emulates a guitar. It is velocity-sensitive and has no MIDI delay.

"Liquid Grooves" and "Burning Grooves" are two new CD sample libraries from ILIO, combining rhythm tracks and organic percussion loops. These CDs can be used for creating new mixes or remixes in alternative, power funk and progressive genres.

ILIO Entertainment products can be viewed at www.ilio.com

For information, contact ILIO Entertainment in California at (818) 707-7222 or circle Reader Service 9.

Audio-Technica Wireless Accessories

Owners of Audio-Technica 300 and 900 Series wireless microphones now have a rackmount kit available to them.



The dual-shelved AT8633 allows two RO3 or RO9 wireless microphone receivers to be mounted in a common location inside a 19-inch rack.

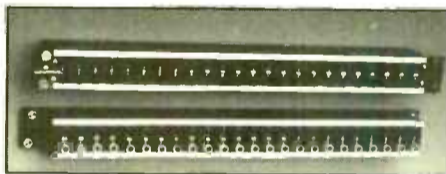
The 900 Series mic operates in the UHF band, above TV, cellular and paging frequencies. The 300 Series operates in the VHF band and is available as a voice or instrument microphone.

For information, contact Audio-Technica in Ohio at (330) 686-2600 or circle Reader Service 48.

Neutrik Patch Panel

Audio patch panels remain a studio necessity, and Neutrik USA has introduced the PatchLink SP to fill the need.

The PatchLink SP is the newest addition to the Neutrik line of economical quarter-inch patching systems. A cage-like panel holds the printed circuit boards in place for mechanical strength and easy access.



Each vertical front-to-back jack pair is half-normalled and the orientation of the circuit board allows different interface combinations. For example, a normalled jack in the front/bottom position results in two isolated vertical front-to-

back channels.

For information, contact Neutrik USA in New Jersey at (732) 901-9488 or circle Reader Service 126.

Hohner Soundcard

Hohner Midia introduced the MIDIA PRODIF 24, a soundcard for audio mastering and multitrack production.

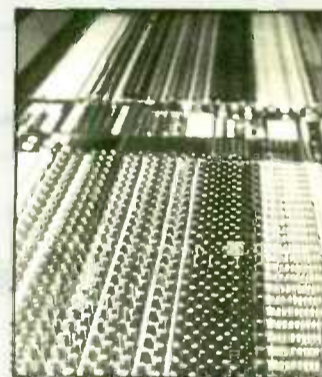
The PRODIF 24 is a full-length card that fits in a standard PC slot. It features 24-bit/16-bit digital audio inputs and an ADAT-compatible, eight-in/eight-out optical interface. The stereo digital I/O connectors handle S/PDIF and AES/EBU signals.

An 18-bit-resolution stereo analog output is available at the card plate, with a level strong enough to drive headphones. Advanced Windows 95 drivers are included and are designed to avoid IRQ conflicts.

List price of the MIDIA PRODIF 24 is \$449.

For information, contact Hohner Midia in California at (707) 578-2023 or circle Reader Service 87.

Coming in
Radio World



Complete Product Coverage
From the 103rd AES Convention

SYSTEMS INTEGRATION

- On Air / Production Studio systems
- Broadcast On-Air and Production Consoles
- Digital Station Automation systems
- Multi Track Digital Editing Suites
- Custom / Modular Studio Furniture Systems
- Transmitter / RF systems
- Digital / ISDN Telephone systems
- Audio / Video Multimedia systems
- Complete Line of Source Equipment

REAL WORLD SOLUTIONS FOR YOUR DUOPOLY, LMA, GROUP OR SINGLE STATION OPERATION



Please contact us
today and put ABG
to work for you!

ABG
Audio Broadcast Group Inc.

SOUTHEAST OFFICE

Voice: 800-369-7623
Fax: 919-934-8120
E-mail: cindy_edwards@abg.com

SOUTHWEST OFFICE

Voice: 800-858-9008
Fax: 805-273-3321
E-mail: tmezey@abg.com

MIDWEST OFFICE

Voice: 800-999-9281
Fax: 616-452-1652
E-mail: support@abg.com

NORTHWEST/INTERNATIONAL OFFICE

Voice: 888-565-9960
Fax: 253-565-9359
E-mail: medved@abg.com

FOR INFORMATION ANYTIME:
VISIT OUR WEBSITE
www.abg.com

USER REPORT

Inovonics Mini-Phone Exchange

Dennis J. Martin

Devices that can be accessed, interrogated and controlled by a dial-up POTS (plain old telephone service) line continue to proliferate at a surprising pace.

Whether communication is via a PC or telephone and speech synthesizer, the user's capability is not restricted by remoteness.

Some unlikely equipment has joined the growing list of devices where operation is enhanced by adding a POTS line: uninterruptible power supplies, emergency power generators, fuel tank leak monitors, and video cameras. Of course excitors and transmitters, remote controls, audio processors, RDS generators, modulation monitors, test equipment and security alarms remain common.

Telephone access no longer is limited to high-priced equipment — a remote control is priced at less than \$400 and an audio frequency generator can be had for less than \$230.

Single-line solution

Unfortunately, telephone lines at remote sites can be costly or unavailable. At a nearby site, insufficient pairs between the telephone company's "demarc" and the lease space prevents expansion.

Distinctive ringing also is not available in all areas. Even if it were, a monthly fee would apply and costly hardware probably would be required.

To meet the increasing demand for POTS lines, Inovonics has introduced the PBX, described as a low-cost, micro-processor-based solution for the multiple-line requirement dilemma.

Fashioned after large-scale PBXs (private branch exchanges, the internal telephone systems used by businesses), the Inovonics PBX allows up to seven devices to share a single telephone line. Additional PBXs can be daisy-chained to expand the device capability in multiples of six (one circuit per PBX is lost due to interconnection).

We found installation to be simple. The Inovonics PBX is connected to the POTS line and up to seven devices are connected via standard RJ11 jacks. Operation is just as easy because no programming is required.

Any device that can dial out receives

central office (CO) dial tone when it goes off-hook, just as if it were connected directly to the telephone line. All other devices connected are denied access until the call has terminated. The same is true for an incoming call — outgoing calls are disallowed until the incoming call has been completed, which helps prevent communication interruptions.

Extension 7 is defined as a Priority channel. When it goes off-hook, it will disconnect any call, incoming or outgoing. This port can be used for a priority device, such as a remote control that can page an engineer should an alarm occur.

We tested the Inovonics PBX with proprietary software supplied by the manufacturers of our emergency generator, remote control and modulation monitor at our transmitter site on Mt. Wilson.

We configured the software to dial the telephone number, added two commas in the dialing string as a pause command to allow the PBX to answer, then inserted the access code and extension number.

In all cases, the PBX connected the device flawlessly and was otherwise transparent to the user.

We followed the same basic procedure using a standard DTMF phone. The number was dialed and the PBX was allowed time to answer. We then entered the access code and the extension number, and waited for the device to answer (a ringing signal is sent to the caller as an acknowledgment until the device goes off-hook).

Once connected, we were able to use the phone to control the device normally — the PBX does not respond to DTMF signals after it has connected an extension.

Even though the PBX was located only a few feet from our transmitter, unshielded and ungrounded along with all interconnecting cables, it consistently performed as expected.

We were concerned that the PBX might become latched in an unusable state, either by error or through some hacker's chicanery.

As we discovered, the PBX will hang up if an incorrect access code is entered within 10 seconds of answering; no access code is entered within 10 seconds of answering; a device fails to answer within 10 rings or when the caller hangs up.

Despite our unscrupulous attempts to foil its operation, the unit never performed incorrectly.

We subsequently learned the Inovonics PBX is not limited only to the control of broadcast-related equipment.

It can be used as a mini-PBX whereby you can connect several phones, an answering machine and a fax machine. The access code blocks unauthorized calls and the single-digit extension allows the call to be routed to the correct phone or device.

Indication

LEDs indicate the status of the PBX. A "CO Off Hook" LED illuminates when the PBX is connected to the telephone company central office. "Modem Off Hook" indicates that the device is connected to the PBX and a Power LED confirms the presence of power.

Seven other LEDs, each associated with a corresponding phone jack, illuminate whenever a device answers or seizes the line itself.

The Inovonics PBX is supplied in a small box that can be easily mounted in a telephone closet. We would prefer to rackmount our unit but a rack kit is not available at present.

The unit is powered by a standard wall-wart transformer — 12 VAC or VDC — and is polarity insensitive, so the tip or sleeve of the power block may be positive. In addition, it can be connected to an appropriate uninterruptible power source for added reliability.

Considering the monthly cost of individual POTS lines at our remote site and how seldom some are used, the PBX from Inovonics could well pay for itself in the near term.

■ ■ ■

For more information from Inovonics, Call (800) 733-0552 circle Reader Service 88.

Dennis J. Martin is chief engineer of KBIG(FM), Los Angeles.

Wire and Wire Not

"Wire, Cable and Fiber Optics for Video and Audio Engineers," by veteran engineer Stephen H. Lampen is the latest edition to McGraw-Hill's technical media books. Lampen is a technology development manager at Belden Wire and Cable.

Highly detailed in treatment and encyclopedic in its coverage, the book touches on the basics of all types of cable, traditional and fiber optic, used in audio and video applications. Such topics as cable and wire types, construction, specifications, performance and use are covered.

Radio engineers will find his sections on audio, cable grounding and performance to be of use. Lampen assumes you know a little but takes nothing for granted. He provides short primers on electronics and audio basics. He also doesn't shy from warnings, commonly made mistakes, safety issues and legal building code guidelines, such as the flammability of some wire and cable products.

Need to know about the myriad of cable types and connectors, what they do, what they're good at, how to make them and how they connect with other pieces of

equipment? Lampen's got a heavily illustrated chapter. If you thought grounding involved only wiring everything to a copper stake in the ground, Lampen will steer you right.

Basics for the beginners (and those of us not recalling a particular detail right at that moment) and advanced concepts for the practiced professional are included, in a style that is a cut above the usual dreary tech text.

As a bonus, Lampen gives a solid look at newer "High-Data-Rate" and fiber optic cables that are becoming part and parcel of the digital audio industry.

This guide is illustrated copiously and includes helpful technical data tables and an up-to-date glossary.

"Wire, Cable and Fiber Optics for Video and Audio Engineers" by Stephen H. Lampen, 286 pages, is published by McGraw-Hill in New York. Retail price is \$55. To order by credit card, call (800) 262-4729. Have the ISDN number of the book handy; it is 0070371482.

— Brett Moss



Affordable, State-Of-The-Art STLs



Digital & Analog

- Ideal for duopolies
- Digital up to 6 channels, plus subcarriers
- Built-in bandpass cavity filters for congested RF environments
- Patented multiple VCO design for low distortion and noise
- All bands 140 MHz to 1.6 GHz
- Frequency agile for easy field retuning
- AES/EBU or analog I/O on digital STLs standard

Phone: 800-347-3383 or 408-727-7272

Fax: 408-727-5942

Website: <http://www.TFTInc.com>

TFT INC

3090 Oakmead Village Drive
Santa Clara, CA 95051-0862

Disaster: The Forgotten Plan

Thomas G. Osenkowsky

In April 1997, I presented a paper at the NAB convention in Las Vegas, addressing the need to plan for disasters at the radio station before and after they happen.

While it is appropriate to take precautionary measures before a disaster strikes, I found by experience that I was remiss and did not address a very important disaster: a personal one.

Crisis

While unpacking my luggage upon return home, I was unexpectedly stricken with an intracranial brain aneurysm.

The aneurysm originally was misdiagnosed as a muscle tension headache. The next day, I returned to my primary care

The information is best stored in written form in a binder and not kept on computer. Should the computer fail and there is no backup tape, the information is lost. Also, your backup person may not be able to get into your computer. He or she might only know one operating system while your station uses another.

In a binder, access to the information can be restricted to those who need to know.

Some of the items are obvious, such as transmitter/tower fence keys and alarm codes. Keep these in the control room in the event of an FCC inspection.

Outside contractors or consultants hired to perform directional antenna maintenance, NRSC measurements and tower

maintenance may not be readily known to management. It is a good idea to keep a list of everyday contractors such as plumber, electrician, landscaper, carpenter, locksmith, computer/network technicians, phone technicians and others who are occasionally employed for specific tasks.

Smooth operation

If you are absent or on vacation, the station will run seamlessly in the event one of the contractors is required to perform a task.

No person is irreplaceable in any business. But in order for an operation to run smoothly, information must be at hand when needed. If you are an independent

contractor, you need to maintain an accurate client list.

If you become ill or unavailable for an extended period, an assistant should contact all clients on the list informing them of the situation. This is not only professional, but good public relations. Disaster is nobody's friend. Finding one's self in a near-death circumstance cannot be called "fun," but the experience is sobering and teaches a valuable lesson.

If you have any doubts regarding what I have written here, all you need do is put yourself in the owner's or manager's position.

■ ■ ■

Tom Osenkowsky is a radio engineering consultant based in Brookfield, Conn., and a frequent contributor to RW.

You should have some redundancy built-in, in case you need to entrust your duties to another.

provider, who ordered a CAT scan. The scan confirmed the presence of the aneurysm. I underwent 12 hours of brain surgery, followed by a month-long hospital stay and rehabilitation.

When I returned to work, I found others at the station had been in need of key pieces of information: codes, passwords and keys that no one else had access to.

The odds are good you will not experience such a crisis, but you should have some redundancy built into your plan in case you need to entrust your duties to another.

Clip and keep

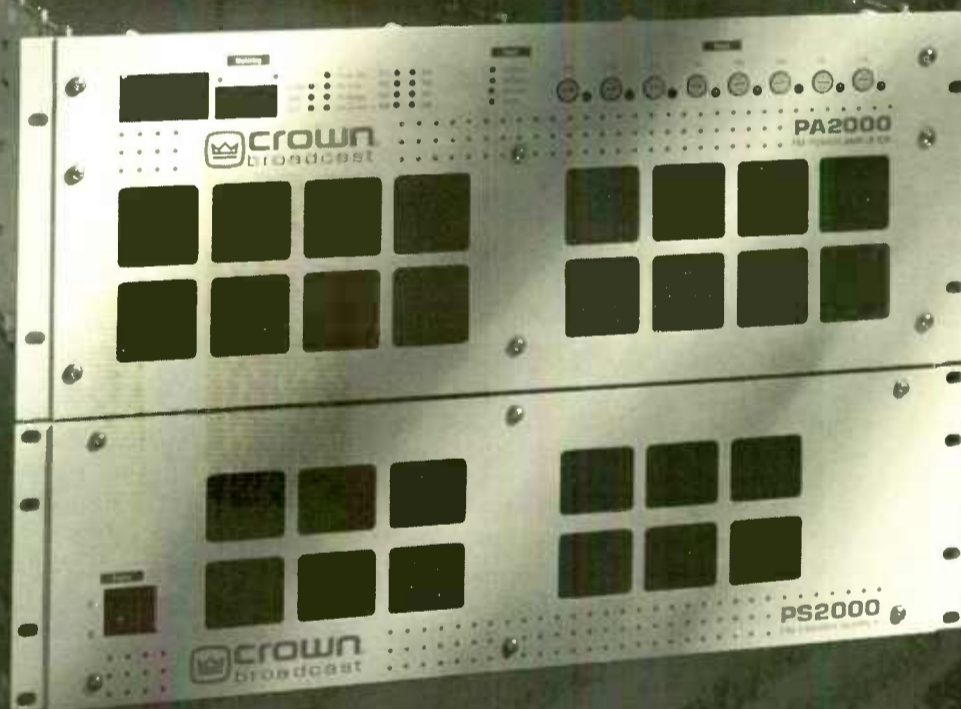
Here is a checklist of information that should be kept on file with the station or business manager. Hang onto it:

- Passwords for networks, computers and software.
- Telephone system message retrieval passwords.
- Audio processor and remote control access passwords.
- Keys to offices, transmitter buildings, tower fences and off-site storage locations.
- Alarm access codes for transmitters, storage rooms and other secure areas.
- Names and telephone numbers for backup engineers.
- Names and telephone numbers for outside support people such as consultants and contractors.
- Location of computer and network backup tapes.
- Schematic diagrams of home-brew equipment and studio wiring diagrams.
- Circuit numbers for any telephone data or STL circuits.

If a key employee in any company falls ill or requires an extended absence, preparations should be made to accommodate the loss.

Too often, simple things like telephone or computer access codes can seriously affect an operation if not readily available. This is especially true when an employee leaves or is terminated.

Efficiency: (e-fish'en-see) n. 1. the most effective use of available resources; 2. great things in small packages; 3. Crown's new FM 2kW amplifier.



Stop the presses on all dictionaries! We're redefining efficiency with our new 2 kW FM amplifier. This **broadband** amplifier requires no field or factory tuning and provides **75-80% RF efficiency** across the band. The design features **hot-pluggable, 500-watt power modules**, and a responsive protection mode. The separate DC supply is **power factor corrected** and 90% efficient. Both units are **lightweight and compact** for easy installation and overnight shipping if required. Use the amplifier and supply with your existing exciter or upgrade to a Crown exciter for an unbeatable transmitter package.

crown
broadcast

50
A R S
Lasting Value

Phone: 800-294-8050; Fax: 219-294-8222

1718 W. Mishawaka Rd., P.O. Box 1000, Elkhart, IN 46515-1000

USER REPORT

Racing With the Olympus D-1000

Paul Kaminski

For some radio reporters, a backup recorder is not simply a nice-to-have item, it's a necessity.

We evaluated the new Olympus D-1000 digital mini-recorder with that in mind when we covered America's Big Three auto racing series (NASCAR Winston Cup, CART Indy style cars and Indy Racing League) during a five-week period this summer.

The smallest details

Digital is the big buzzword in our industry. Yet most radio reporters covering

auto racing still rely on analog cassette recorders.

The D-1000 unit appears to be designed as a replacement for the ubiquitous micro cassette. Now don't turn up your nose; I've seen micros used for radio ENG.

The D-1000 is compact, about the size of two large cigars laid side to side. It records on postage stamp-size flash cards of 2 and 4 MB capacity and has mini-plug jacks for an external mic and earphone. It runs on two AA cells and one button battery.

Sound can be edited, albeit destructively — once the offending pieces are

selected and played, they become cyber-history.

The buttons are smallish, so ham-fisted folks might have some problems punching in a hurry.



A New Mini Recorder From Olympus

At a sampling rate of 8 kHz, the frequency response is 300 to 3,000 Hz, or about the same as a good dial-up phone line. At 12 kHz, response goes up to 5,000 Hz.

Watch levels

The mic input is rated at -70 dB, which means that hot mult-boxes and dynamic mics like the Shure 57 give it fits. You can hear some of that high-end clip when you play it back through a Mackie 1202.

That which is recorded is clear. If recordings or excerpts are flagged with an index mark, they will play back instantaneously.

The D-1000 is something that you can throw in your pocket and forget about, or hook up to a properly padded mult-box and let roll. It is priced reasonably at \$299 list, but I have seen it for \$249.95.

I consider the D-1000 more a survival piece than something you would want to use to produce an entire program. If your gear were to be lost on an airplane, and all you had was the D-1000 and a set of alligator clips in your pocket or briefcase, you could still send sound back to the studio.

As a back-up piece, for emergency transmission and perhaps for some creative processing and dubbing in the studio, the D-1000 is inexpensive insurance.

If your livelihood depends on getting sound from newsmakers, and you transmit over POTS lines, the D-1000 may make the difference between getting the recording or missing a story.

My two cents

If Olympus were to modify the D-1000 for front-line radio ENG duty, it would probably cost about the same as a MiniDisc recorder. I think shifting to a 24 kHz sampling rate could give a 10 kHz frequency response.

Set the input to -50 dB, give us at least 45 minutes of recording time, keep it easy to mark and edit recorded sound and such a unit would be more than adequate for most domestic radio ENG done over POTS phone lines.

As configured, the D-1000 is a useful tool for that last-resort, gotta-get-the-story backup plan.

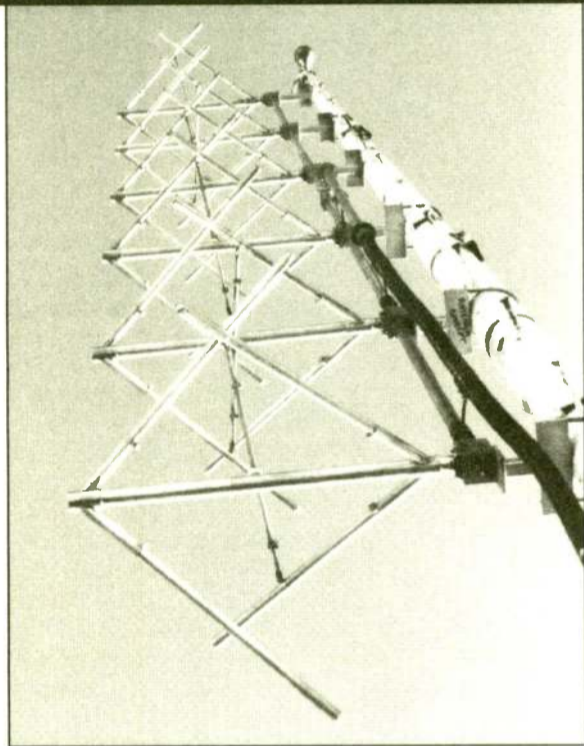
For more information on the Model D-1000, contact Olympus America at 2 Corporate Center Drive, Melville, N.Y., 11747-3157; call (516) 677-1600, or circle Reader Service 127.

■ ■ ■

Paul Kaminski is news director for the Motor Sports Radio Network and host of "Race-Talk" and "Radio-Road-Test."

Got a comment about this review, or an idea for one of your own? Drop us an e-mail at pmclane@imaspub.com

ULTRA TRACKER



WHAT'S UP WITH ALL THESE NUMBERS?

They have the solution to these serious FM problems:

You can see your station, but you can't hear it

(Multipath due to side lobes stealing expensive power from your main signal)

Interference from your station affects nearby electronic equipment

(RFR/RFI caused by downward side lobes misdirects your ERP instead of covering your market with a single solid signal)



ANTENNA CONCEPTS INC.

6601C Merchandise Way
Diamond Springs, CA 95619

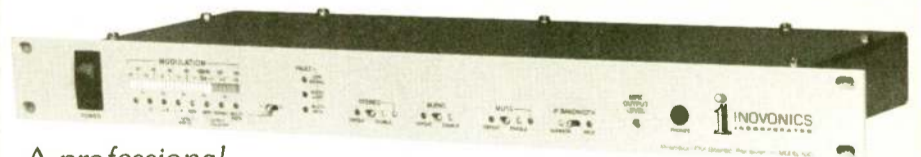
▲ Tel: (916) 621-2015 ▲

▲ Fax: (916) 622-3274 ▲

▲ www.antennaconcepts.com ▲

Circle (91) On Reader Service Card

FM "Relay" Receiver



A professional FM receiver for re-broadcast "translator" service, and for similar demanding off-air pickup applications.

- DIP-switch-programmable synthesized tuning.
- Composite MPX and balanced stereo program outputs.
- Selectable IF bandwidth.
- Carrier-loss and program-loss alarm outputs.
- Accurate front-panel metering of MPX and program audio levels, plus signal strength and multipath distortion.
- Auto-mute and auto-blend features.
- Remote control of front-panel selectable functions.

MODEL 630 FM "RELAY" RECEIVER

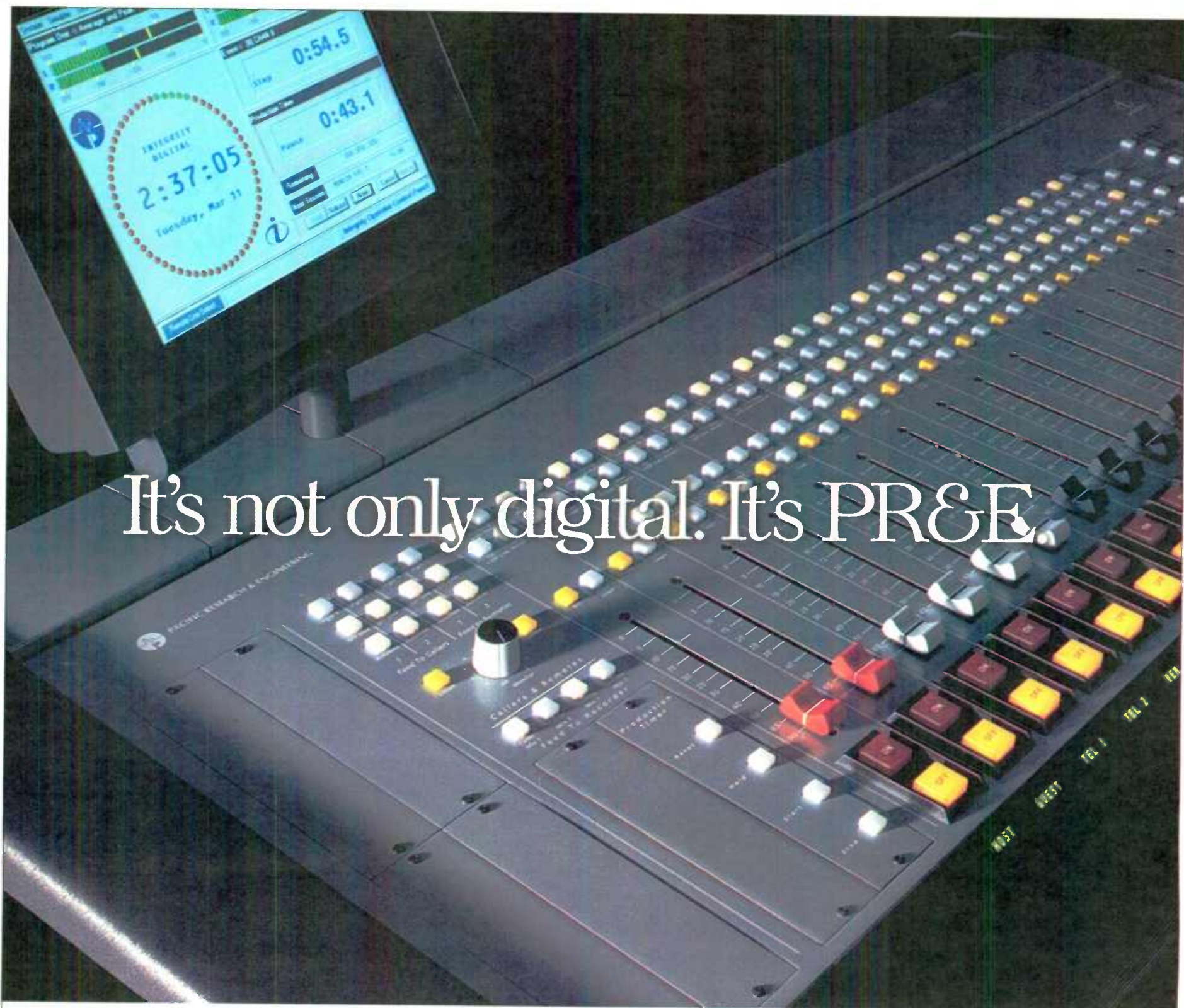
Inovonics, Inc.

1305 Fair Ave., Santa Cruz, CA 95060 USA
TEL: (408) 458-0552 • FAX: (408) 458-0554

www.inovon.com



Circle (130) On Reader Service Card



It's not only digital. It's PR&E.

Now you can get digital technology and PR&E reliability in the same console. Integrity.[™] It's the first digital on-air board that also speaks fluent analog. All 16 inputs can handle analog signals. Ten can also accept digital inputs at any sample rate. So you can deal with the hodge-podge of equipment in real-world studios. A unique architecture also guarantees a level of reliability other digital consoles can't match. So you can rest assured your signal will stay on the air.

What's more, you get on-board DSP voice processing, remote or local configuration controls, and channel-specific remote control connections. And you can set, save and recall each board configuration at the touch of a button for seamless transitions from show to show.

For a brochure, call us at 760-438-3911, visit www.pre.com or e-mail sales@pre.com



The LCD displays audio levels, time-of-day clocks, session status and event timers with a Windows[®] interface to powerful configuration management and session-based features.



Integrity's difference is more than just digital. It also offers four special-purpose buses to provide automated mix-minus for telephone and remote feeds, each with IFB.



Integrity uses an array of state-of-the-art floating-point digital signal processors to perform its mixing, routing and other functions.



Each fader has a 10-character alphanumeric display. The display changes when another audio source is assigned, which can happen either manually or at a preassigned time.



PACIFIC RESEARCH & ENGINEERING

Circle (169) On Reader Service Card
World Radio History

A Picture Paints a Thousand Feet

Troy Conner

Ah, the joys of tower work. I am writing this article while sitting on a hard mattress in a cheap hotel in Indiana. Given the choice of a \$95 room or a \$45 room, I chose the latter, although I may indeed already regret that decision.



Photo 1: Don't look down! Partway up a 160-footer

Adding further insult to injury, the tiny TV is fuzzy and, despite my attempted adjustments, every channel is tinted orange. It is about 11 p.m., and I have just settled in after more than 10 hours on the road.

You might say words escape me.

For that reason, and because my RW editor has been pestering me for "more pictures!", this trip up the tower is based entirely on photographs.

This one's a breeze

Photo 1 shows the view from the mounting arm of a small, 160-foot self-supporter. We do a lot of light antenna work like this. The photo shows a typical two-way antenna for a tenant on a county-owned structure.

Photo 2 looks as if we are enjoying a beautiful day, doesn't it? Wrong! You may remember a story I wrote back in June about a particularly windy job we did in eastern Tennessee.

Despite the deceptively clear blue skies, it was the worst wind I have ever had to work in. The Weather Channel had called for gusts to 55 mph, and I am inclined to believe them.

Jim Davis, waving cheerfully from just beneath the eight-bay FM antenna,

did an exceptional job that day. Jim is a Brasstown, N.C., resident, an avid rock climber and former construction project manager.

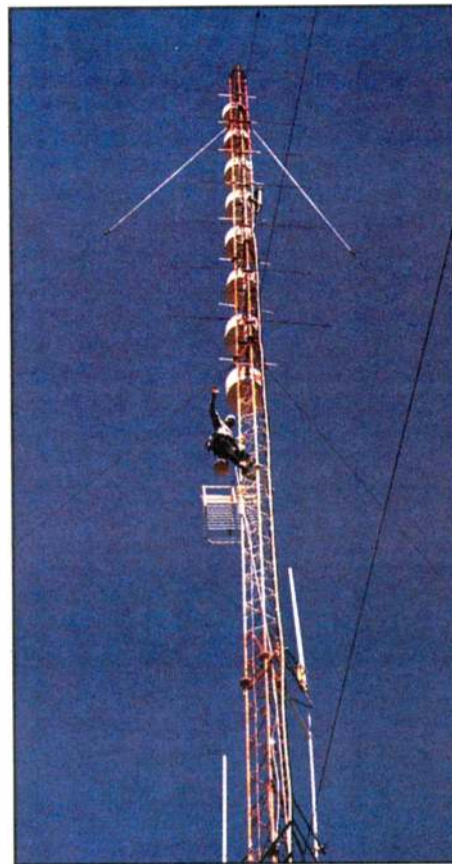


Photo 2: Windy up there?

Despite the horrendous wind, we managed to lower a lightning-damaged 3-inch coaxial line and raise a new one into place. At one point, a hacksaw I was pulling up on the end of a rope blew sideways about 8 feet away from me.

As I pulled it towards me, I was actually pulling horizontally. I think it was then that the station owner and engineer, looking up through binoculars, understood what kind of conditions we were working in.

Reflector elements

Note the 8-to-10 foot passive reflectors mounted horizontally behind each of the white drum-like FM antenna elements.



Photo 3: Robert Hamilton

During gusts, the ends of these reflectors would oscillate at least a foot each direction. It was a bit disconcerting, to say the least.

In Photo 3 you see Robert Hamilton, 34, of Andrews, N.C. Robert is our electrical whiz, Air Force-trained in "mobile tropospheric scatter radio systems." He has been working



for us part-time for a couple of years now.

Here he is rewiring the obstruction lights of a little AM tower in town. This is a typical small-guyed AM tower, 200 feet tall, with hollow legs and a face width of 12 inches. The tower is at least 40 years old, and approaching the end of its useful lifespan.

Favorite hangout

Here's Robert again in Photo 4, this time hanging out on the support arm for a new cellular array on a monopole in Hayesville, N.C. I suspect he is yelling at me to put the camera down and get to work.

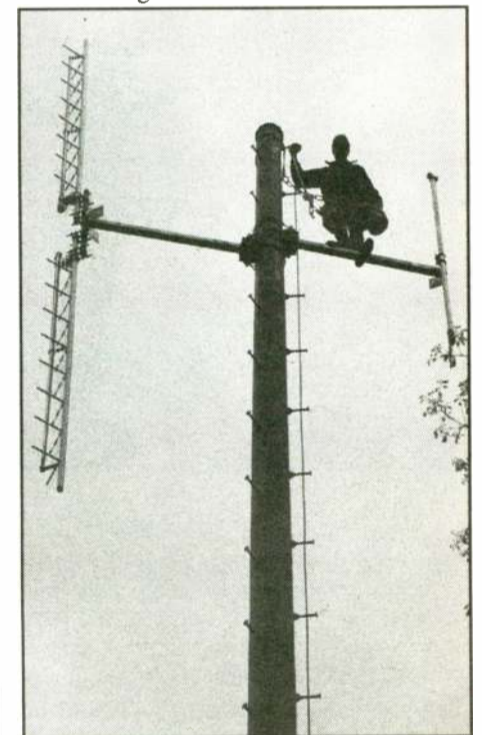


Photo 4: Robert, making a call!

We have a lot of fun working together. Robert constantly is singing, joking and doing imitations.

One photo we didn't have room for here was taken from a long way up. There is one 1,100-foot FM tower in Wake Forest, N.C., we had to climb. Go back to the picture of the 160-foot stick, then imagine us nearly nine times higher. My truck looked the size of a Tic-Tac.

Well, I'm out of time and out of space. Hope you enjoyed the aerial photography. Please feel free to contact us with any tower-related ideas, issues or questions.

Troy Conner is the owner of Tower Maintenance Specialists. Reach him by phone at (704) 837-3526 or via fax at (704) 837-1015.

Got a question you'd like Troy to answer? Send it to RW at pmclane@imaspub.com

<p>RF COMPONENTS</p> <ul style="list-style-type: none"> • Transmission Line Rigid/HELIAX® • Waveguide • Filters/Combiners UHF/VHF 	<p>TV ANTENNAS</p> <ul style="list-style-type: none"> • UHF • LPTV • VHF • Dual mode
<p>FM ANTENNAS</p> <ul style="list-style-type: none"> • Sidemounts • Panels • Combined Systems 	<p>PANEL ANTENNAS</p> <ul style="list-style-type: none"> • FM • UHF • VHF

W

hen You Want More Than Just An Antenna

Made in USA since 1954

JAMPRO ANTENNAS/RF SYSTEMS, INC.
 P.O. Box 292880 • Sacramento, CA 95829 usa
 Phone (916) 383-1177 • Fax (916) 383-1182
 www.jampro.com • E-Mail: jampro@ns.net

HELIAX® is a registered trademark of Andrew Corporation

AMERICA'S HIGHEST BILLING RADIO STATIONS

Rank	Station	City	Billing
X 1.	WGN	Chicago	\$ 35,800,000
X 2.	WFAN	New York	35,100,000
3.	WINS	New York	29,300,000
X 4.	WXRK-F	New York	29,000,000
X	KIIS-AM	Los Angeles	29,000,000
X 6.	KRTH-F	Los Angeles	28,500,000
X 7.	KGO	San Francisco	27,800,000
X 8.	WCBS-F	New York	27,300,000
X 9.	KROQ-F	Los Angeles	26,700,000
X 10.	KABC	Los Angeles	26,600,000

NOTE: Revenue totals are gross with no trade. Network compensation is included if known. Estimates are based upon input from managers in each market. surveys sent to group CEO's and my own judgements and formulas.

5 DUNCAN'S RADIO MARKET GUIDE
Copyright 1996

Others like to brag about their client list. We let Duncan's do it for us.

Nine out of the ten highest billing radio stations listed in Duncan's rely on PR&E. Why? Maybe its our durability. Virtually all of our original BMX consoles are still in service today. Or maybe it's our reliability. After all, downtime and make-goods cost money. Then again, it could be our decades of industry experience. Whatever the reason, our clients are happy. Better yet, they're successful. Just look at the list.

To receive a brochure on the full line of PR&E products and services, contact us at 619-438-3911, e-mail sales@pre.com or visit www.pre.com.



Air Consoles PR&E on-air consoles are the first choice of many of the nation's top broadcast personalities.



Production Consoles Similar layouts between production and on-air boards let operators work seamlessly on both.



Digital Workstations Familiar analog features enable a smooth transition from cut-and-splice to digital editing.



Cabinetry We offer a range of studio furniture, including custom, modular and ready-to-assemble designs.



Integrated Systems Our turnkey solutions cover your entire project—from design through installation.



PACIFIC RESEARCH & ENGINEERING

Circle (14) On Reader Service Card

World Radio History

Floodproofing a Transmitter Site

James F. Pinkham

There once was a great Atlantic hurricane called Agnes, which wreaked havoc on land and sea some 25 years ago. It brought a flooded Susquehanna River down full-bore onto Harrisburg, Pa.

The river crested 22 feet above flood stage. The damage in the city and surroundings was extensive. The water reached the second floor windows of the Governor's Mansion.

A 1 kW Class Four AM station was, at that time, located downtown atop the eight-story Penn-Harris Hotel. The old station survived the winds of the storm,

which had moderated by the time it reached Harrisburg.

However, it could not survive the city planners and architects who decided to raze the old hotel.

One month deadline

At the time, I was employed by John H. Mullaney Consulting Radio Engineers. In a state of panic, the owners of the station called us to Harrisburg to find a new site with barely 30 days to make the move. They were not interested in another hotel roof, even if one could be found.

The old self-supporting rooftop tower with its folded unipole and ground

counterpoise mounted eight feet off the hotel roof was hardly a technical dream.

The "ground" was literally 8 feet — plus eight stories — above terra firma.

The building was constructed of weather-proofed concrete block.

It posed many maintenance problems and required frequent repairs and retuning.

The ground system was less effective than a conventional one on ground level. Heavy ground straps had to extend the distance from the roof to the ground to bring the rooftop counterpoise close to ground potential.

After looking at several possible sites in the suburbs, they finally found a site in a unique location: City Island, right in the middle of the Susquehanna River, on property belonging to the city of Harrisburg.

A traffic bridge across the river connected to the island at its northwest end by a ramp. A railroad bridge crossed the river at the southeast end of the island.

The ground level at the site was flat,

only about 6 feet above the normal river level. It was decided to use a guyed grounded tower about 150 feet tall and construct a transmitter building with a foundation well over 20 feet high.

A complete ground system comprising 120 radials one quarter-wavelength long, interlaced with 120 additional 50-foot radials, extended outward from the tower foundation. Six-inch ground strap extended from the tower base (without base insulator) to the foundation of the transmitter building.

A rectangular grid of 6-inch strap was buried beneath the foundation, with more strap extending up the outside walls of the foundation at four locations: two on the north-east side and two on the southwest side. Additional strap extended across the grid in a modified waffle pattern.

All radial wires encountering the rectangular grid were silver-soldered to the grid and continued on the other side of the building foundation. The radials at the tower base were silver-soldered to a copper pipe extending around the tower base, also soldered to the 6-inch strap.

Even more straps

More strap extended up all four sides of the tower base and across the top of the tower base. Here the strap was silver-soldered right to the tower itself.

Just below the top of the foundation, the straps were folded across the building at a level allowing the strap to enter

See FLOODPROOFING, page 60 ▶



The Harris Annual Expo is Tuesday, October 21st at the Clarion-Leland in uptown Richmond, IN.

This is an event where CEs, PDs, and GMs can learn from key leaders in the industry plus see the latest generation of equipment for radio and TV.

E. Glynn Walden, DE for CBS Radio Stations, will speak at the luncheon for radio. Insights on the bright future of digital on-air broadcasting will be discussed. John Battison, founder of SBE and its first president, will regulate the "Nuts & Bolts" discussion on the Digital Roadway at the radio dinner. Joining in the discussion will be Chris Scherer, Don Markley, John Bissett, Marvin Born, and John Delay.

As special treat, Gary Burbank is scheduled to broadcast his show live.

Demos on equipment will also be available from key suppliers in the broadcast industry.

Harris provides continental breakfast, lunch, and dinner with keynote speakers for customers. If you would like to attend, please call 765-962-8596, ext. 289 for reservations. Exhibits,

meals, and presentations are **free of charge.**



See Products From:

- 360 Systems
- ADC
- AKG
- Andrew
- Aphex
- Arrakis
- ATI
- Audioarts Engineering
- Auditronics
- Auralex Acoustics
- Belar
- Belden
- Burk Technology
- RFS Cablewave
- Comrex
- Comsat RSI
- Crown
- dbx
- EVI Audio
- ENCO
- Fostex
- Gentner
- Gepco
- Intraplex
- JBL
- Marti
- Moseley
- Orban
- RDL
- Radio Systems
- Rane
- Register Data
- Roland
- Shure
- Sony
- Symetrix
- Tascam
- Telos
- Wheatstone
- Yamaha



© 1997 Harris Corp.



BAYS
Stainless steel construction, input connector type N, Maximum input power per Bay 600W, circular and vertical polarization
POWER DIVIDER
Brass made, chrome plated, EIA 7/8 input connector, Broadband 88-108 MHz, maximum input power 2 kW. Stainless steel mounting brackets included double step.

JUMPER CABLES
 1/2 inch coaxial cable, included male

PRICE
\$1,650.00
Offer valid until May 1997

OMB also Manufactures:

- FM transmitters
- TV transmitters
- FM and TV Links
- TV antennas
- Medium power FM antennas

OMB America
 3100 NW 72 Ave #112
 Miami, Florida 33122
 Phone: 305-477 0974
 Fax: 305-4770611
 Toll free: 888-OMB-4-USA
 E-Mail: info@omb.es

MP 2-4

For other radiating systems please contact us
1-888-OMB4USA

Workbench

Radio World, October 15, 1997

Big, Small Ideas in the Big Easy

John Bisset

Mike Lawrence, the Radio Field Service Supervisor for Harris Corp., wanted me to clarify the availability of a service information supplement we offered in a previous column. Harris offers a service supplement to owners of its FM-25K transmitter.

In August of 1993, this supplement was mailed to all stations that have the FM-25K transmitter. Contrary to representations made in this column, this supplement is not a compendium for all Harris transmitters. It is, instead, product specific for the FM-25K model only. Engineers who are responsible for this transmitter are encouraged to request this service supplement from Harris; call (217) 222-8200. Note that all of the updates discussed in this supplement have been implemented in the Harris HT-20/25 series FM transmitters.

A more general publication, one that will assist engineers in developing a comprehensive plan to guard against emergency situations, is found in a paper presented at NAB '97 by David Kobe, the manager of Harris' Broadcast Technology Training Center. It is titled "Staying on the Air." Circle Reader Service 80 for a free copy.

★ ★ ★

Speaking of transmitters, I'd like to thank the engineers, managers, and air staff who attended the AM-FM Transmitter Workshop at The NAB Radio Show in New Orleans. We've received some positive comments from those who attended, and hope to do it again.

For those of you who missed the workshop, a five-tape cassette package of the day's activities can be purchased for \$44. Contact Audio Magic in New York, (800) 679-3646, and request Tape #1011-T04. They accept VISA and Mastercard.

The transmitter introductory lecture, delivered by Milford Smith of Greater Media, is a great way to introduce non-technical or semi-skilled technical staff to AM and FM transmitters. It's very basic, but also a good review for the more seasoned engineer.

Another highlight was the transmitter manufacturer's panel. A lot of good tips and suggestions were offered by representatives from Broadcast Electronics, Continental and Nautel. Special thanks to these companies for sparing the time to help educate us!

We wrapped the session up with a panel of engineers discussing their worst engineering nightmares, how they solved them and what they did to prevent them from recurring. Again, some great tips, suggestions and ideas.

Finally, let me thank all of you who had such nice things to say about the *Workbench* column. It is *you* who make this column what it is, and I'm grateful for your support, and to know we're reaching so many people.

★ ★ ★

As I mentioned, a lively discussion with regard to transmitter maintenance concluded the session, and some very good tips were offered. And yes, we also took up the issue of vacuum vs. compressed air for cleaning transmitters.

With that in mind, one engineer suggested an inexpensive addition to your Shop Vac. Go to any of the building supply stores and pick up a contractor's filter. This is an addition filter that contractors use when vacuuming drywall dust. It prevents the vacuum exhaust from circulating all the dirt and grunge your vacuum is removing from the transmitter. The addition of the filter not only keeps your transmitter building cleaner, but your lungs cleaner too.

★ ★ ★

If you have a problem with rodents in your transmitter or ATU, plug the cable entry holes with pieces of fiberglass insulation. Don't forget to use gloves. Other materials can be chewed through by these animals or removed for nesting material, but not the fiberglass insulation.

We have a client site that is a haven for mice and snakes. We're always spreading mothballs around the floor to deter the snakes, and the fiberglass insulation has kept the rodents out of the transmitter.

I've recently taken this fiberglass thing a step further, placing fiberglass along the floor of the rack. It appears the vermin are scurrying up power cables and leaving their mark all over the equipment. If they hate fiberglass so much, maybe this will work. I'll keep you posted!

★ ★ ★

Longtime engineering associate and friend Ellis Terry of Douglas Broadcasting shared a website that is a must-see if you maintain Arrakis Digilink hard drive systems. Sean Mattingly is the chief at WWWO, and he maintains the Engineer's Corner on the station web page.

He has compiled a list of software problems, fixes and suggestions for the Arrakis Digilink. The information helps the station communicate software problems to the company, and they are responding to the feedback. I've always

found it useful to know I wasn't the only one having problems with a piece of equipment — helps you keep your sanity! Plus, you don't have to give anyone a credit card number!

Visit Sean's Engineer's Corner, or send comments about the Arrakis Bug List to Sean at: sean@www.com

★ ★ ★

I learned this "strength in numbers" strategy early on, when we kept getting misfires from our satellite-delivered music system. An ID would fire instead of a stopset or "magic call." I'd call the satellite service, and they'd swear it was my equipment. After about a month of getting raked over the coals by management for "all my screw-ups," I called and got an affiliates list. My next calls were to two stations in medium-sized markets, who had full-time

engineers. Surprise! They were having the same misfiring problem, too. And, yes, they were also told it was *their* equipment.

Armed with the information, I went to the general manager. He arranged a conference call in which we linked all three stations on speaker phones, then we called the program provider. After listening to a repeat of, "it's got to be your equipment, we've gotten no other complaints," the GM asked the other stations on the line to relay their identical problems. The station relations person reluctantly admitted that perhaps the jock pushed the wrong button, firing an ID where a stopset should be. Our conversation didn't eliminate the problem, but service was vastly improved.

■ ■ ■

John Bisset is a principal with Multiphase, a technical services company. Reach him at (703) 323-7180. Printed submissions qualify for SBE recertification credit. Fax submissions to (703) 764-0751, or send them via e-mail to wrbench@aol.com

Great Tools.

When we can't find the right tools for the job, we build them. Here are two of our newest. The MD-1 combines a high-quality mic preamp with a clean headphone amp, and adds a line input and mix control. It's ideal for parabolic and news mics.

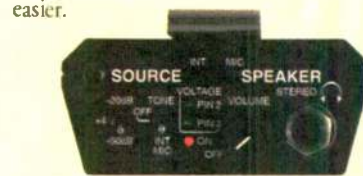
The MD-1 provides a transformer isolated line-level feed for long cable runs.

The two easily removable 9V batteries also provide switch-selectable phantom power for condenser mics.

The Qbox is a battery powered audio line testing system that includes a built-in mic, reference tone generator, speaker, headphone amp, and voltage presence LEDs to detect phantom or intercom power.

You can monitor a dynamic mic, the feed from the truck, or an intercom line. You can use the tone generator to set levels or keep a cable live until you've found out which connector at the other end belongs to it. Two Qboxes hooked together make a simple intercom.

Put some of our new tools in *your* toolkit this week. Our goal is to make your job a little easier.



A complete test set for audio cables.



whirlwind

Toll Free 888-733-4396 • Fax 716-865-8930 • <http://www.whirlwindusa.com>

Harris Expo Continues to Grow

Brian Galante

Radio engineers and managers will come to Richmond, Ind., this month to attend the annual Harris Broadcast Expo/Open House on Oct. 21. The event is a combination of trade show, seminar and a chance for friends to catch up, and it serves as a learning opportunity for those who cannot make the national shows or enjoy the more intimate setting of a regional one.

Distant national shows also can put a dent in the wallets of attendees. The Expo is free, and all in attendance will receive a free lunch and dinner.

The Expo has experienced sizable growth over the years, according to Dave Burns, Studio Product Manager for Harris Broadcast Division.

"The Expo started out in our warehouse with a few friends, and has grown to approximately 200 people," he said. "We like to call it an 'appreciation party.'" Last year's attendance peaked at 197, and Burns expects attendance to grow by 15 to 20 percent this year.

A radio focus

The event will focus on radio, with digital radio in the forefront. Broadcasters will have several informational sources to choose from. Some 40 vendors will be on hand to explain their wares. The Expo also boasts five well-known speakers, prominent in broadcast. As a bonus, there will be a section dedicated to digital television.

"This is the first year we've really catered to television," Burns said. "We've felt the pulse, discovered the hunger and developed a highly educational, as well as promotional, program for television broadcasters."

Among the speakers scheduled to appear is Gary Burbank, a 17-year veter-

an of "The Gary Burbank Show" and a self-made comic legend. Burbank will do



his show from the Expo, adding an extra reason for program directors to attend. Described as a cross between Gary Owens, Monty Python and Quasimodo, he has become something of a cult hero. He won the Marconi Award for radio personality of the year two years running and has received several other awards in the course of his career.

Also speaking is Glynn Walden, the director of engineering for CBS Radio Stations. He will update attendees on the progress of research into in-band, on-channel digital audio broadcasting and the quest for CD-quality digital radio. Walden has an excellent vantage point on the future of DAB, as part of the team of engineers working on the USA Digital Radio project.

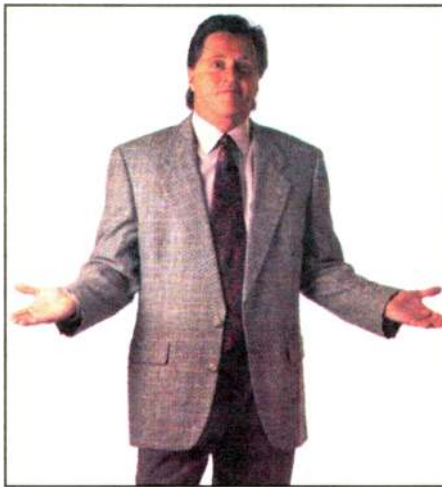
John Battison leads off this year's nuts and bolts session with his topic on the "Digital Roadway." Battison is a consulting engineer, founder and first president of the Society of Broadcast Engineers. Joining Battison will be guests Chriss Scherer, Don Markley, Marvin Born, John Delay and RW

Workbench columnist John Bisset.

Rounding out the day's speakers are Dave C. Kobe and Chip Schneider. Kobe is manager of the Broadcast Technology Training Center, and manager of technical productions including the new Harris DTV training facilities. Prior to his 16 years at Harris, Kobe was the director of training at Coyne American Institute in Chicago. Schneider is business development manager at Harris Broadcast Systems and has been a member of the design and proposal team for many digital broadcast facilities installed by Harris worldwide.

TV too

As mentioned, this year's Expo will be the first with emphasis on



Gary Burbank

television technology, featuring several hours of information and education for television engineers. There will be presentations on technical issues of ATSC startup, including scanning formats, compatibility during the transition years, standard definition vs. high definition, the multi-channel vs. single channel debate, and signal transport standards.



What: Harris Broadcast Expo/Open House

Where: Clarion Leland Hotel, Richmond, Ind.

When: Oct. 21, 8 a.m. to 6 p.m.

How Much: Free admission

To register: Call (800) 622-0022 Ask for "Expo Registration"

Presentations on the transition will include the steps, the missing links, the issues and the costs, budgeting, ATSC encoding and ATSC studio-to-transmitter links.

Burns said he is looking forward to a positive reaction to the 1997 Expo. For many broadcasters, he said, the Expo has become the top choice of trade shows.

"With upwards of 40 vendors returning this year, we feel that the Expo will keep growing," he said. "We want to continue with this type of promotion and hit every possible angle."

Expo Exhibitors

Confirmed as of Sept. 24

- 360 Systems
- ADC
- AirCorp
- Andrew
- Aphex System
- Arrakis
- ATI
- Auditronics
- Auralex Acoustics
- AV Marketing
- Belar
- Belden
- Bob White Associates
- Burk Technology
- Cablewave
- Comrex
- Comsat RSI, Mark Antennas
- ElectroVoice
- ENCO
- Gentner
- Gepco
- Intraplex
- Marti
- McFadden
- Monfort
- Moseley
- On-Line Marketing
- Orban
- Radio Design Labs
- Radio Systems
- Register Data
- Roland
- Sony
- Sound Marketing
- Starin Marketing
- Symetrix
- Tascam
- Tektronix
- Telos
- Wheatstone
- Yamaha

Why *limit* Your possibilities

mediatron offers you the complete digital solution for your Radio Station!

Based on mediatron **plug-in** technology, Windows NT 4.0, standard PC- and network- configuration with unlimited audio storage (MPEG) using harddisk.

- Cart replacement, live assist and 24h automation
- Newsroom- and cartwall- systems
- News editing, text and audio
- Multitrack recording and editing
- Notebook recording, editing and communication
- Satellite automation
- Program scheduling
- Traffic integration
- ISDN and Internet
- Archive solutions



WANTED:
DISTRIBUTORS

The best, talk to us. mediatron



Ask for our documentation or
<http://www.mediatron.com>

mediatron GmbH
Postbox 43 07 12
80737 München
Germany

Phone ++49-8131-8305-0
Fax ++49-8131-8305-25
e-mail sales@mediatron.com

HAM RADIO

Talking Tubes With George Badger

Al Parker, N2SAG

Last spring's NAB show in Las Vegas was memorable for me.

Besides keeping up with technology, there was a personal agenda: a look at the much-talked-about Svetlana 572B triode. With its ceramic base, plate-cap spacer and transmitting tube-gauge glass envelope, it looked robust enough to drive nails.

I was sold on the tube, but was also fortunate enough to be introduced to the president of the company, George Badger, a fellow ham radio aficionado.

Lifetime of tubes

George Badger, W6TC, has spent many years engineering and marketing power grid and microwave tubes, beginning with Eimac. He has a B.S. in electrical engineering from the University of California at Berkeley.

He holds seven patents, numerous

RF signal introduced to the cathode. The RF output was taken from the plate with an appropriate output tank circuit.

This simple arrangement became known as a "zero-bias grounded-grid configuration." It was amateur radio ingenuity at its best. This innovation had a monumental influence over the progress of SSB technology.

Before SSB, a desktop kilowatt amplifier was science fiction. A typical 1 kW AM transmitter filled a six-foot rack. A major advantage of SSB over AM is the lower average power per kW of talk power. The carrier is provided by the receiver instead of the transmitter,

with only one sideband radiated.

This lower duty cycle allows scaled-down components and power supplies. Collins Radio recognized this advantage and pioneered SSB following World War II.

RW: Did Collins Radio first discover the commercial application of grounded grid-triodes?

BADGER: It was the hams within the Collins organization. Gene Senti, WØROW, worked in the lab at the Collins Cedar Rapids facility. His dream was a very small 1 kW linear. Strictly for fun, he built the pioneering

prototype in his home workshop. He wanted to take full advantage of the low average power of the SSB signal.

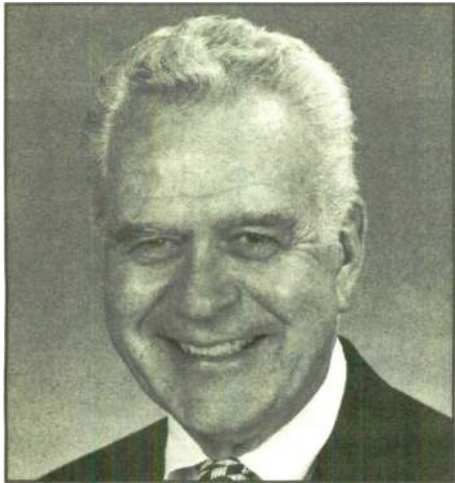
Gene used four 811 triodes in parallel. RCA originally designed the 811 for audio modulation service. Gene had the knowledge of the 811 and the imagination to envision its use in a linear.

RW: Was the experiment an instant success?

BADGER: From all accounts, the performance of Gene's compact home-brew linear was close to miraculous. The little dynamo impressed Gene's good friend, Arlo Meyer (WØLBK), one of Collins' most gifted mechanical engineers.

Arlo owned a Collins S-Line but couldn't afford the awesome and elegant companion 30S-1 linear amplifier, even

See HAM, page 54 ▶



George Badger of Svetlana

amateur radio awards and is a Fellow in the Radio Club of America. Hams and antique radio collectors owe Badger a debt of gratitude for keeping "hollow-state" (tube) technology alive and well through his work as president of Svetlana Electron Devices.

Our discussion got around to the origins of the 572B and its genetic parent, the venerable 811/811A.

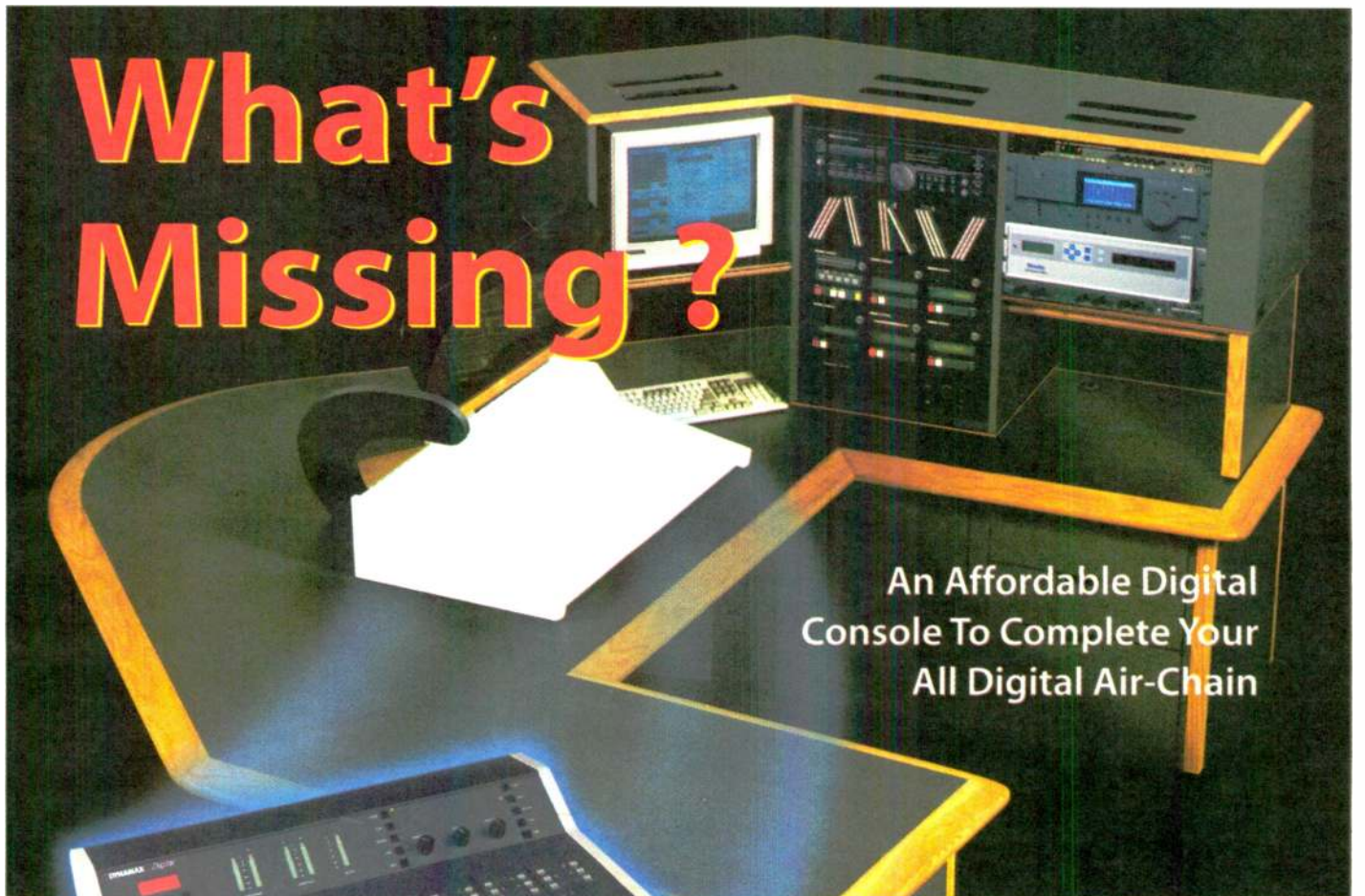
These amazing triodes have done yeoman service for half a century in a range of applications, from hi-fi audio to broadcasting. A best friend of amateur radio operators, the 811 is at the core of some of the most economical and efficient amplifiers built to this day.

The Svetlana version of the 811A pays ultimate tribute to the concept by employing state-of-the-art technology to enhance its performance. George Badger took time from his show schedule to answer my questions about the 811A in linear service.

RW: The use of the grounded-grid 811A in amplifiers seems obvious today, but surely a group of human beings had to perform a leap of imagination to make it a practical production concept.

BADGER: Clever amateurs were building simple linear amplifiers for single sideband (SSB) by connecting together the control grid and screen grid of war surplus tetrodes like the 1625, a version of the 807 power tube.

For tetrodes to operate like high-mu triodes, the grids were grounded and the



DYNAMAX MX/D

Digital Audio Console

So your old on-air console needs to be replaced.

Most of your air chain is digital and you know digital broadcasting is just around the corner. What do you do? The Dynamax MX/D Digital Console makes perfect sense. It offers pristine 24 bit internal processing to handle both digital and analog inputs and outputs with the familiarity and straight forward operation of analog consoles. A perfect blend of digital sonic quality, performance features and legendary Dynamax reliability, the MX/D is the right console to meet your current needs and take you well into the 21st Century!

Complete
Digital On-Air Console
Under \$10,000

- 8 faders controlling 16 total inputs
- Choice of analog or digital input modules
- 3 digital plus 3 analog outputs (stereo PROG and AUD plus mono)
- AES/EBU and S/PDIF digital inputs with sample rate conversion
- Independent A/B channel remote start and stop
- Solid steel construction with excellent RF immunity
- Built-in cue amp/speaker, headphone amp and count up timer



FIDELIPAC®

Broadcast Studio Equipment
Fidelipac Corporation Division of Amplifonix
2707 Black Lake Place, Philadelphia, PA 19154 . USA
TEL: 215-464-2000 . FAX: 215-464-1234

Talking About Tubes

► HAM, continued from page 53
under the generous Collins personal purchase plan. Even today, second-hand 30S-1 units command prices beyond the reach of most mortals.

When Arlo saw Gene's four 811s on a homemade chassis, he immediately began a mechanical redesign so a linear and power supply would fit into a standard KWM-2 cabinet. The innovative Collins KWM-2 was the most desirable 100 W SSB transceiver of its day.

Use of facilities

RW: Were Meyer and Senti doing this refinement project strictly on their own?

BADGER: Collins' policy encouraged employees to use company facilities and resources for home amateur radio projects. With typical ham enthusiasm, Arlo made sheet metal drawings and fabricated two sets of parts, while Gene collected two sets of electrical components. They made identical amplifiers for their personal use.

Gene brought his amplifier to work to show his ham friends in the lab. Chief Engineer Bob Cox got wind of Gene's prototype unit and, while not formally sanctioned by Collins management, submitted it for a management review.

Management was reluctant to embrace the idea because Art Collins'

policy was that all SSB equipment be designed for at least 40 dB linearity. That rigid standard ruled out anything but highly linear tetrodes. The 811 could not perform to that rigorous standard, but the allure of a small desktop linear with simple circuitry was too compelling.

RW: How did the "true believers" overcome such a major roadblock?

BADGER: Cox knew Art Collins was first and foremost a man with superb technical and marketing instincts, so he showed him the prototype. The idea "in the flesh" was so irresistible that Mr. Collins instituted a crash development program.

Gene, Arlo and the team worked 24 hours a day under what was known as a Green-Room project, with no budget restrictions and all of Collins' considerable resources at their disposal.

RW: How has the 30L-1 held up under the crucial test of time?

BADGER: 30L-1 amplifiers have been in continuous use since the '60s. Production ended years ago but the 30L-1 remains popular on the second-hand market and are quickly snapped up at hefty prices.

Manufacturers continue to pay homage to the basic 30L-1 today by utilizing the same design approach. Successors to the 30L-1 throne also



The Svetlana 811A Triode

RW: Do you see "hollow-state" RF and audio triode amplifier design as a totally mature science or does the future hold further developments?

BADGER: The old 811A and the 572B are being designed into new equipment even as we speak. Svetlana has developed six new audio-specific versions for the pro-audio market so the tradition continues from 1939, when RCA first brought the 811 to market.

RW: With such excellent triodes available today, are there still advantages to tetrodes?

BADGER: When Art Collins turned away from high-performance tetrodes for the simple triode-driven 30L-1, the world was also simpler. There were only five HF amateur bands. Today we have nine and we have SWR-sensitive solid-state transceivers.

These two changes have created a recent trend among manufacturers back to the use of tetrodes. Newly developed modern tetrode amplifiers are simpler and less expensive than their predecessors. Tetrodes are superb and efficient performers. Solid-state devices are also wonderful until you look at power output, linearity, and especially the price tag!

For information on Svetlana tubes, contact the company in California at (415) 233-0429.

Al Parker writes from Hicksville, N.Y. He can be reached at aeparkerham@juno.com



MAGER SYSTEMS

The Best in Sound Furniture

Designed, Fabricated, Delivered and Installed

21602 N. Central Ave., Suite 1
Phoenix, Arizona 85024
TEL: 602-780-0045
FAX: 602-780-9860



WPGC

TIRED OF THE SAME OLD STUDIO FURNITURE?

For over 17 years Broadcasters nationwide have come to Mager Systems for our exquisitely designed studio furniture. Our unique construction, along with solid wood and quality materials, means your furniture is built to last. In fact, we've made the design and construction of studio furniture as much an art form as it is a business. Every installation is backed by a 10 year warranty. Our quality is affordable and can accommodate every budget from economy to showplace. Call today and discover why Mager Systems is the best in Sound Furniture.



KOOL FM



KXGL



KTAR-AM

AVONITE®

Mager Systems is very proud to offer Avonite Solid Surface. Avonite is a non-porous solid surface material with depth and richness of stone in an easy-to-care for composite surface. Avonite is available in over 45 natural looking colors. Highly stain and scratch resistant, it boasts durability with the confidence of a full 10 year warranty.

ROOTS OF RADIO

A Ribbon Is Not for Wrapping

Ronald Pasha

Microphones improved rapidly during the first decade of radio broadcasting. Early radiotelephone reliance on carbon granule microphones quickly moved to various forms of dynamic transducers.

Engineers reduced the mass of the diaphragm and designed a symmetrical magnetic field. The resulting improvements quickly made these microphones universally accepted in broadcasting,



The Classic RCA 44DX Mic

mass provided exceptionally accurate reproduction of high frequencies. The natural sub-audible resonance of a loosely suspended strip of foil helped retain good low-end performance.

The old Radiotron Designer's Handbook said, "It is undoubtedly the best type of microphone for high fidelity, particularly for transients." But the mic's fragility kept it inside studios.

Many chief engineers have had to replace stretched or broken ribbons which succumbed to wind damage. I do not recall ever seeing a pop screen — that affectation of DJs — configured for

the RCA 44-D or the smaller Junior Velocity microphone.

The classic velocity microphone profile — a long diamond shape truncated at top and bottom — became a symbol of broadcasting in the 1930s, along with round windows on studio doors and "On The Air" warning lights.

The RCA 44-D shown in the photo was a heavy beast, with a larger, coarser mounting thread than what is in standard use today. For many years, dealers stocked a threaded adapter to step down to today's 5/8-inch thread.

The velocity microphone's natural bidirectional characteristic even set a

style of performance. Its Figure-8 pattern placed two (or two groups of) radio performers facing one another: Bob Hope on one side, Jerry Colonna or Doris Day on the other side.

D.I.Y.

Back in my teenage years, I was fascinated by the elegant simplicity of ribbon microphones. So as a young lad, I set out to fabricate one.

I lined up 20 toy bar magnets side by side, with another set of 20 — poles opposed — on the other side of a gap. The ribbon was some Christmas tree tinsel which, 50 years ago, was made from thin aluminum foil rather than today's aluminized plastic product. I corrugated the foil for lateral strength, then mounted in the magnetic gap.

See RCA, page 56 ▶



You



AudioVAULT®

Whatever you want, it'll do.

Well, just about everything.

AudioVAULT from Broadcast Electronics can't make coffee (yet), but it will build your ratings and grow your bottom line and that's a good start. AudioVAULT was designed to be designed by you - to fit your operations, your format, your overhead goals and your technical challenges. That is why it is the best selling digital system in the world. It works for you.

Anything you can imagine, AudioVAULT can handle. From playlist management, show prep, to satellite integration, spots, even walk-a-way automation, AudioVAULT is your studio manager. If

you want it to happen in the studio, production suite or newsroom, it can happen with AudioVAULT.

For station groups, AudioVAULT is the key to harnessing the power of your WAN. Everything it can do for one station, it can do for dozens. And because of its architecture, AudioVAULT will grow as your station grows. And it's backed by Broadcast Electronics, The World's Radio Company, with 24-hour service and support, every day of the year.

Call for a free sales kit, demo CD-ROM and video today at 217-224-9600. Or contact us on the internet at www.bdcast.com.



BE BROADCAST ELECTRONICS, INC.
THE WORLD'S RADIO COMPANY

4100 N. 24th Street/P.O. Box 3606/Quincy, IL 62305-3606/(217)224-9600/Fax: (217)224-9607
Internet: <http://www.bdcast.com> • E-Mail: bdcast@bdcast.com

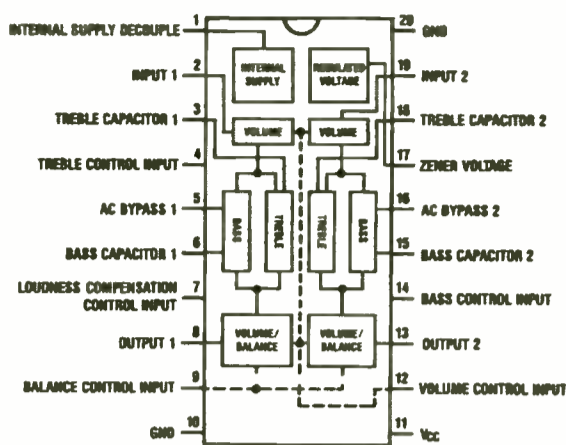
Chip Inspires Audio Tinkering

Alan R. Peterson

For engineers who enjoy tinkering with black-box circuits, a versatile audio IC is available from National Semiconductor that can be used in home-brew mixers and remote leveling controls.

Description

The LM1036 is a dual DC-operated tone/volume/balance circuit on one chip. Four control inputs on the IC provide control over bass, treble, volume and channel balance. Control voltages can be applied remotely or from four inexpensive potentiometers biased to an internal zener regulated supply.



All control takes place on the chip with no audio passing through the pots, so simple unshielded wiring can connect the pots to the DC source. Wiring runs need not be short and inexpensive carbon pots can be used.

Tone response in the bass and treble EQ circuits is defined by single capacitors to ground for each circuit; rotary switches with multiple capacitors can select any of a number of EQ responses and rolloff points.

The LM1036 is not an

amplifying device. Input voltage must be typically $1.1 V_{RMS}$ and the outputs on pins 8 and 13 are at unity gain, although an extra 2 dB can be coaxed out of the chip.

Applications

The possibilities of this IC are interesting. Several can form the heart of an active micro-stereo mixer with selectable two-band EQ and -10 dB line inputs for CD machines, PC soundcards and cassette decks, all inside a tiny seven-dollar Radio Shack hobby box.

Use a stock op-amp (1458, TL082 et al.) as a summing/amplification stage if using several LM1036 chips to construct a mixer. Tie the output to an LM380 amplifier chip to make an external cue amp or spot monitor.

With a flat frequency response up to 16 kHz, projects made with the National Semiconductor LM1036 will be no threat to major console manufacturers anytime soon. But having a few of these chips within reach may inspire some creative black-boxing on the bench.

Visit the National Semiconductor Website at www.national.com for specifications on the LM1036 and other audio products or circle Reader Service 119.

PUT IT THERE

DIGITALLY CLEAR



Starlink 9003T1

All-Digital Studio-Transmitter Link For T1/E1 Lines

The Starlink 9003T1 offers all the features and performance you require to take advantage of decreasing T1 rates for STL/TSL programming feeds:

- Provides uncompressed 16-bit linear audio
- AES/EBU and analog I/Os on a single module
- 32, 44.1 or 48 kHz sample rates
- Intelligent multiplex with drop and insert
- Optional voice, data, ISO Layer II and apt-X cards
- Flexible full duplex network configurations

Moseley

Moseley Associates, Inc.
111 Castilian Drive
Santa Barbara, CA 93117

The Trusted Name In Communications

Phone 805-968-9621 Fax 805-685-9638 Website <http://www.moseleysb.com>

Circle (54) On Reader Service Card

World Radio History

Remember Ribbons?

► RCA, continued from page 55

Lacking a step-up transformer, I fed the ribbon output directly to an amplifier mic input with the gain turned high. It actually worked!

An adolescent memory of a homemade microphone's sound quality probably is as rosily inaccurate as the memory of early girlfriends. The mic surely was not high-fidelity, but was definitely natural-sounding.

Despite 20 or so feet of cable and the high gain dialed in to the amplifier, I recall no hum problems. The microphone's source impedance was extremely low, with the 3 inches of foil probably measuring only an ohm or two.

A side note to this endeavor: my homemade microphone skills served me years later when a church wanted to broadcast its weekly service on a small-town station. One condition: there could not be a visible microphone.

The sanctuary had some PA speakers in those ubiquitous sloped wooden baffles, so I added another speaker and fed it as a mic into the input of a remote amplifier. It worked fine, with a reasonably natural sound coming across the 5 kHz telco line back at the station.

Thanks to Rich Redmond, north-east radio sales manager at Harris Corp., who loaned me the RCA 44-D mic shown in the photographs.

■ ■ ■

Ronald Pesho is associate professor of Broadcasting at Adirondack Community College, Queensbury, N.Y.

Got a radio memory to share? Drop Ronald an e-mail at peshar@acc.sunyacc.edu or send a note to RW.

Telling It Like It Was, On Screen

Dee McVicker

Jim Davison got a front-row seat to the history of rock and roll when Hollywood rolled into his hometown of Cleveland and started filming "Telling Lies in America," a movie about a disc jockey on the take from a record company.

The movie, to be released by Banner Entertainment this year, stars Kevin Bacon and is set in 1961 in Cleveland, the birthplace of rock. Thirty-something-year-old Davison, a radio memorabilia collector and owner of the Radio Broadcast Museum in Garfield Heights, Ohio, had missed the original showing of the birth of rock and roll almost 40 years. But history has a way of repeating itself, thanks to Hollywood, and this time Davison played an important role.

Memory lane

Jim Gelarden, a Cleveland-based designer who was hired as the production designer for the movie, sought out vintage collector Davison at the start of his search for circa 1950 and 1960 radio gear for the movie set. He called on other local collectors and museums, including the Rock and Roll Hall of Fame and Museum, also in Cleveland.

Davison lent the movie-makers some of his most prized collection pieces.

"When they called I didn't believe them. I mean, when someone says, 'I'm filming a movie with Kevin Bacon and I'd like to use your stuff,' what can you say?" he said.

Everything had to be authentic, "right down to the 1958 penny on the tone arm," he said. He referenced old photos archived at the Cleveland State University to get the right feel for the set.

Davison gladly accommodated the film crew, anxious to share what has become a lifelong pursuit of the history of Cleveland radio during the 1950s and '60s.

"Back then, AM ruled the airwaves ... the music was great, the jocks were great, and they actually listened to the listeners," he said, adding ruefully, "They don't do that anymore. Everything is syndicated."

As a youth, Davison's interest in radio was sparked by a family friend, who owned a radio station and invited Davison to hang out there on the weekends. He started collecting bumper stickers, T-shirts, cups; he saved anything with a station call letter on it. By his 30s, he had gathered some of Cleveland's oldest and most beloved boards and microphones. He brought them together in his home museum in Garfield Heights, where they reside today.

"Telling Lies in America" is set in 1961 at WHK(AM), the legendary Cleveland rocker where disc jockeys like Alan Freed became stars in their own right. Kevin Bacon plays a charismatic DJ, and Brad Renfro plays an immigrant boy discovering radio and America in

screenwriter Joe Eszterhas' story. Maximilian Schell plays the boy's father, whose old-world values conflict with those of his son.

Bacon is said to have researched his role by watching and working with disc

Hollywood, with films such as "Flashdance," "Jade," "Showgirls" and the box-office hit "Basic Instinct" to his credit.

Although the physical layout of the studio set for "Telling Lies in America" was different than that of 1960s WHK because of filming necessities, it featured many original WHK studio pieces. Highlights include a WHK on-air light, a telephone used by WHK, RCA ribbon microphones complete with WHK logo and even the original WHK playlist, which stood out prominently on the back wall of the studio set.

Jim Pogras, a second generation Cleveland station engineer who is now the chief engineer for WKNR(AM) in Cleveland and whose father was an engineer at WHK during the 1960s, was able to acquire from his family home the on-air light and the telephone. As a kid he would visit the station with his father, and record whatever was on the air at the time. He quite possibly has the largest collection of on-air checks from WHK during the 1960s.

Pogras' services as an engineer were enlisted to help with the wiring of the reconstructed radio studio, and he had a reputation on the set as being able to work magic with the equipment. "He played a big part," said Davison. If something failed or needed a vintage part, he said, Pogras knew just what to do.

There was plenty that could go wrong. Two racks in the back of the set containing old Schafer/Scully automation reels

were a constant reminder of radio then and now. Also a testament of the times were several RCA transcription turntables.

"Most of the broadcasting of that time wasn't recorded onto tapes like reel-to-reels or cassettes, because they didn't have any. So they would just drop a needle down on one of these big discs and they would record the president's speech or song and dance programs at supper time. And they would duplicate those and send those off to different stations to be aired later," Davison said.

Red and Blue

Davison also loaned the crew a prized board made in the '30s and used by NBC station WTAM during the '50s. "It was actually a little bit older board, from when NBC had two networks, a Red and a Blue network, so there were two buttons for red and blue on there. That was the board we used, as if it was a really old station patched together," Gelarden said.

"Believe me, (the set) looked original. They even had the peg board up on the wall and they would spray it like a yellow tint to make it look smoky, and they would burn cigarettes along the console table just like they did at WHK way back then," said Davison, who was a regular spectator on the set.

The movie was filmed in a warehouse on Cleveland's Scranton Road, and the Landmark Office Tower downtown served as the exterior of the station. Filming was completed in August 1996, after only 24 days of shooting. The movie set then was dismantled and returned piecemeal to Davison's home museum, perhaps destined to repeat history in another movie.

"Telling Lies in America" was presented during the March 13 opening night of the 21st Cleveland International Film Festival and was expected to be released to theaters this fall.

Davison is hopeful his recent walk down Memory Lane will live on and that the movie will result in a movie soundtrack of '60s hits. "Wouldn't that be neat if they put out the album, and on the front or back they show the WHK studio?" he said.

History has recorded stranger things.

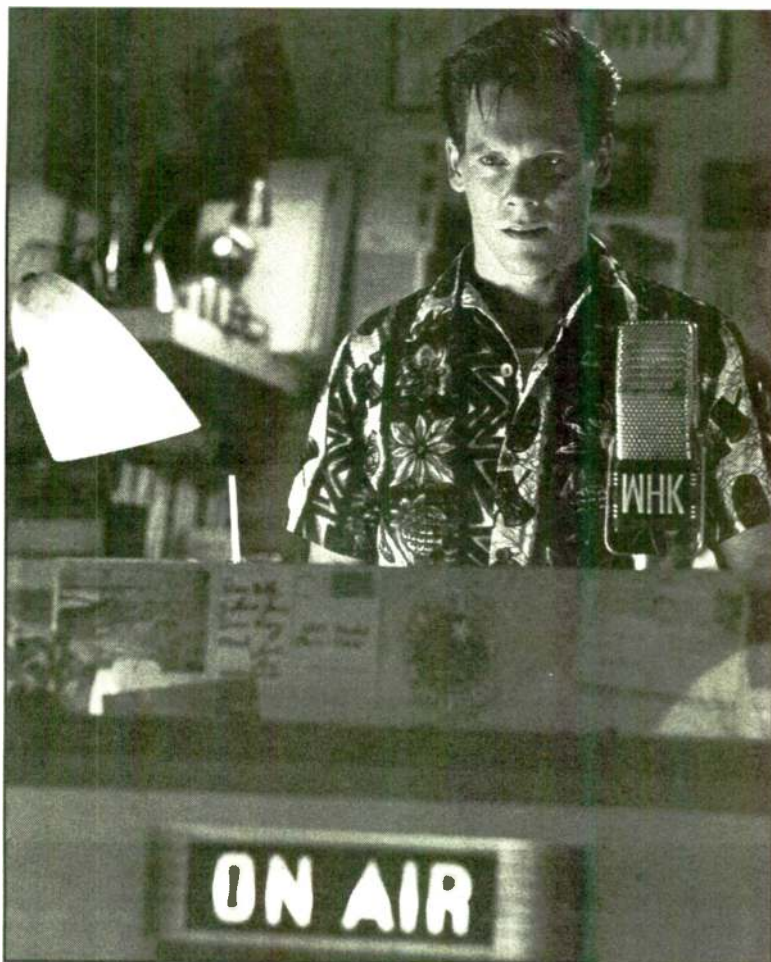


Photo by Deborah Samuel

Kevin Bacon stars in 'Telling Lies in America.'

jockeys in his hometown of Philadelphia and studying the extensive archives at the Rock and Roll Hall of Fame and Museum. Bacon made a surprise visit to the museum one evening to spin a few disks and perfect his radio style.

Eszterhas is an immigrant from Hungary who grew up in Cleveland and listened to WHK as a youth. He is now one of the highest paid screenwriters in

Analog & Digital A2-D

Audio Measurement System

The affordable instrument
Designed to meet the challenges of tomorrow's testing needs

- Analog & Digital Generator and Analyzer
- User friendly front panel
- Stand-alone or remote control via RS-232 or IEEE-488
- Portable

We set the standard in making audio testing AFFORDABLE

NCI Liechtenstein Division of NEUTRIK AG 9494 Schaan Phone +41 75 237 24 24 Fax +41 75 232 53 93	NCI GmbH 93051 Regensburg Germany Phone +49 941 920 57 0 Fax +49 941 920 57 57	NEUTRIK Instrumentation Inc. Montreal Canada/USA Phone +1 800 661 63 88 Fax +1 514 344 52 21
--	--	--

NEUTRIK CORTEX INSTRUMENTS
AUDIO ANALYZERS+PSYCHOACOUSTICS

Circle (93) On Reader Service Card

SIGNAL TO NOISE

A Killer Antenna for FM Radio

Frank Beacham

To receive clean FM broadcasts in the crowded RF jungle of New York City, one needs a decent radio, a good antenna and a lot of luck.

Terk Technologies has just upped the ante in the antenna department. Its new 58-inch long FM Pro model (\$119.85) is big-time artillery for doing war in the RF jungle.

"The FM Pro was created as the ultimate antenna for the FM connoisseur," said Neil Terk, president and CEO of the company known for its high-tech consumer antenna line. "This antenna was

designed by computer. It's a no-compromise design. It gives you the ability to bring in a very pure signal."

Terk says the antenna design combats frustrating signal reflection drift and the effects of multipath.

At first glance, the FM Pro resembles part of the mast from a sailboat. The dipole antenna element with its figure-8

pickup pattern is encased in a sleek waterproof plastic wand that is designed to be mounted horizontally against a flat

surface.

That surface can be outdoors on the exterior wall of a building or under the eaves of a roof. Indoor possibilities are an attic or an interior wall, preferably near a window.

With the FM Pro, Terk claims that strong signals stay locked in and weaker

The antenna is long — nearly five feet long — and arrived in a box that no doubt could also be used for shipping snow skis.

However, after unpacking the FM Pro, the stylish esthetic of the design became obvious immediately. This is one elegant antenna!

Under cover

It also is surprisingly easy to hide. I mounted the antenna horizontally with wood screws behind a cabinet under a window. I then connected a piece of 75-ohm coax to the antenna and ran it to the little AC-powered in-line amplifier supplied by Terk. The amplifier then is connected to the FM receiver using one of the supplied adapters.

Because most of the FM signals in my area are strong, I fired up the system with the amplifier turned off. With some stations, the improvement with the FM Pro over previous antennas, including one from Terk, was dramatic.

For example, the 90.7 MHz signal



broadcasts are received with less noise. The design is supposed to combat frustrating signal reflection drift and was engineered to minimize the effects of multipath.

Improved fringe reception

Using a nominally half-wavelength design, the company said, signals are pulled in from fringe areas while reducing interference to very low levels on the entire 88-108 MHz FM band.

I decided to give the FM Pro antenna a workout in one of the nastiest FM reception environments I know of — my Upper West side apartment in New York City.

Here on the 15th floor of "multipath mountain," I can size up a good radio and antenna in a New York minute.

My first surprise was the sheer size of this antenna. The photo is deceptive.

from Fordham University station WFUV in the Bronx, a personal favorite, suddenly changed from being marginal and interference-prone to clean, dependable and stable. Unfortunately, not every signal improved. The reception from WNYC at 93.9 remained poor no matter what I did with the antenna.

Varying the placement of the FM Pro can help overcome multipath interference with some stations. Though the pickup pattern of the antenna is wide, said Neil Terk, there are nulls at the ends that allow the user to improve the signals of problem stations.

"If you have two stations reflecting back at you, you can rotate the antenna slightly toward the stronger signal and aim away from the weaker one," said Terk. "That can get rid of multipath."

Another feature unique to the FM

See PRO, page 60 ▶

FINALLY!

A Listener Information System for Broadcasters!

NEW!



Audio OnLine from Henry Engineering

The caller-interactive telephone system that's perfect for:

- Concert information
- Weather/Ski Reports
- School Closings
- Road & Traffic Reports
- Contest Info
- Voting Lines

Audio OnLine answers up to 16 phone lines simultaneously, and lets your listeners choose from dozens of messages!

Audio OnLine is quick, easy and caller-friendly.

- Answers 2-16 Phone Lines
- Call Counter for Each message
- Hundreds of messages
- Hours of Recording time
- Installs in any 386+ Dos PC*

Replace those tired cart decks, phone couplers, and other junk with digital technology. Get Audio OnLine...your listeners will love it!

Contact your Harris Representative today!

TEL: 1-800-622-0022

FAX: 1-317-966-0623

<http://www.broadcast.harris.com>



*Computer & monitor not included.

Circle (132) On Reader Service Card

A Best-Value FM Mod-Monitor



An off-air FM Monitor of remarkable value. First-class features and outstanding performance have made the Model 530 a favorite the world over. Check these product highlights:

- Accurate, high-resolution bargraph metering of carrier deviation and demodulated program audio; pilot, subcarrier and residuals. Meter also displays signal strength and multipath distortion to aid antenna alignment.
- Pushbutton tuning with 8 station presets for "comparative market evaluations."
- Rear-panel outputs for composite MPX and balanced program audio; plus remote peak flasher, carrier-loss and program-loss alarms.

MODEL 530 FM MODULATION MONITOR

Inovonics, Inc.

1305 Fair Ave., Santa Cruz, CA 95060 USA
TEL: (408) 458-0552 • FAX: (408) 458-0554

www.inovon.com



Circle (171) On Reader Service Card

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

SCA?

Turn To The Industry Standard!



Sidekick® Audio Subcarrier Generator
From Modulation Sciences, Your Processing Authority

Reading service, foreign language network, background music—however you use your SCA, the ONE place to turn is Modulation Sciences. The Sidekick has been the subcarrier generator of choice for more than a decade. The Sidekick® combines everything you need for successful, interference-free subcarrier operation into one, easy-to use package:

- Crystal-controlled subcarrier generator
- Built-in modulation monitor
- Integrated audio processor
- Significantly reduced crosstalk
- Built-in transmitter tuning aid

PLUS Modulation Sciences' three-year warranty on all parts and labor.

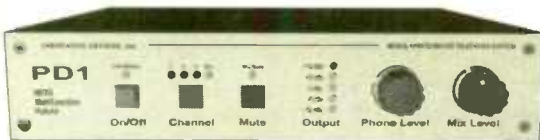
Call Modulation Sciences today.

12A World's Fair Drive,
Somerset, New Jersey 08873
Voice (908) 302-3090 Fax (908) 302-0206
Toll-Free (800) 826-2603



READER SERVICE NO. 76

FEATURE PACKED HYBRID!




The PD1 Multifunction Hybrid

A full-featured analog hybrid in a small, low cost package. The Phone Dock's small size & low price make it ideal for production studios, news facilities IFB listen lines, dial-up transmitter monitoring, and remotes.

- Just 8.5 x 1.75" (desktop)
- Single/tandem rackmount
- DTMF (touch tone) control
- RS-232 Control Port
- Relay and DC outputs
- Available now for \$499
- Automatic/manual answer
- Automatic disconnect
- Microphone & line inputs
- Level controls with LED VU
- 4 channel input routing switcher
- Input mute (& much more)

Take control of your phones! CALL:
Broadcast Telephone Systems



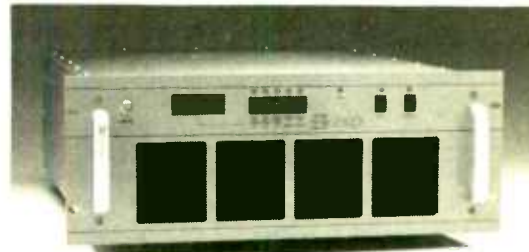
email: info@innovadev.com
web: www.innovadev.com **1-888-890-7424**

Innovative Devices, Inc.


READER SERVICE NO. 36

Solid State, FM Broadcast POWER AMPLIFIERS

TO 1200W




P.A. Modules
50W, 150W, 300W, 500W, 700W
In stock for immediate delivery
Repair service available, MMD, AMT modules



**Silicon Valley
POWER
AMPLIFIERS**
The RF People
115 Phelan Ave., Unit 10, San Jose, CA 95112
1-800-986-9700 or Fax 1-408-986-1438
www.svpa.com e-mail: sales@svpa.com

READER SERVICE NO. 75

Fits In Even "STINGY" Budgets!



DOZENS SOLD!

The hot new **DELUX™** quality built **SPACEWISE** system!
BASIC SYSTEM \$1245!
FULL SYSTEM \$2540!

GENERAL FEATURES: Basic system consists of main counter top and two PC system pedestals ... then you add on what you need from there, such as racks and shelf wings or talk table wings for a full system.

USER FEATURES: Two PC system base pedestals ... heavy rack rail systems with easy access standard ... passive ventilation systems throughout ... adjustable shelves ... wiring block backplane ... customizing ... quick installation.

DURABILITY BUILT IN: Top counters are two ply 1 1/2" thick with quality name brand laminate with protective 1 1/2" solid wood trim raised on the outside perimeters. Plus ... generous vertical and horizontal solid wood trim and recessed kickboards.

SPACEWISE® Broadcast/Furniture
CALL 800-775-3660
Visit our web catalog: www.spacewise.com
"The Broadcasters Furniture Store"

READER SERVICE NO. 35

Cortana Corporation

Affordable, Rugged Lightning Protection

Let us show you how stations in Florida and Gulf Coast states have solved their problem.

Many stations have recovered the cost of the Stati-Cat System during their first lightning season.

For brochure and/or quote, call or write:
CORTANA CORPORATION
P.O. Box 2548, Farmington, NM 87499-2548
Voice 505-325-5336
FAX 505-326-2337




READER SERVICE NO. 115

1,000,000 LNBS and growing!

Norsat celebrates the shipment of 1,000,000 Low Noise Block Amplifiers to the satellite industry

Since its first shipment of an all GaAs FET LNA in 1983, Norsat has consistently introduced LNBS recognized for quality and performance. Our dedication to industry-leading reliability, combined with innovative new technology, has enabled Norsat to ship 1,000,000 Low Noise Block Amplifiers and earn recognition as the world's #1 commercial LNB supplier. Today, we supply C, Ku and Ka-band LNBS and block converters to customers in more than 50 countries worldwide.

For next day delivery or consultation on customer products, contact Norsat today.



NORSAT

Contact Norsat at:
#302-12886 78th Avenue, Surrey, British Columbia, Canada V3W 8E7
Canada • Tel 1-604-597-6203 • Fax 1-604-597-6214
<http://www.norsat.com/> • info@norsat.com

READER SERVICE NO. 114

VACUUM CAPACITORS



- Variable or Fixed Types
- Capacitance Ranges from 3pF to 6600pF
- Peak Test Voltages to 100kV
- Current Ratings to 1000 Amperes

Ideal for Semiconductor Fabrication, Broadcasting, RF Heating/Drying, Medical (MRI), Avionics, Scientific, and other RF power applications.

COMET North America, Inc.
89 Taylor Avenue, Norwalk, CT 06854 USA
Phone (203) 852-1231 Fax (203) 838-7427



READER SERVICE NO. 74

**YOUR SOURCE
FOR QUALITY
ENGINEERED RADIO
BROADCAST
ANTENNA SYSTEMS
FROM COAST TO
COAST**

KINTRONIC

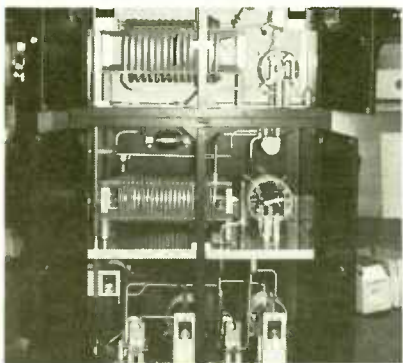


AMERICAN EXPRESS
VISA
LABS, INC. MasterCard

**IF YOU'RE THINKING
EXPANDED BAND**

**THINK OF KINTRONICS FOR YOUR
ANTENNA SYSTEM NEEDS!!!**

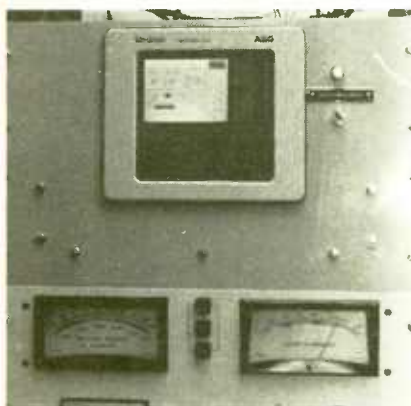
**AM DIPLEXED DIRECTIONAL
ANTENNA PHASING SYSTEM**



**KPHP / KFXR RADIO
PORTLAND OR**

NEW PRODUCTS

**MODEL DAC-MOD-2-12 SERIES
SOFTWARE PROGRAMMABLE
DA SITE CONTROLLERS**



WXBQ RADIO BRISTOL, VA

**PRE-FABRICATED, CLIMATE-
CONTROLLED DA TUNING
HOUSES**



1010 WINS NEW YORK, NY

KINTRONIC LABORATORIES INC.
P.O. BOX 845
BRISTOL, TENNESSEE 37621-0845
PHONE/FAX: 423-878-3141/4224
WEB SITE: <http://www.kintronic.com>
EMAIL: ktl@kintronic.com

Circle (210) On Reader Service Card

Notes From a Flood Plain

► FLOODPROOFING, continued from page 50 the floor trenches constructed in the transmitter room.

The walls of the building extended upward to a peaked roof with rain gutters. A steel entrance door on the southwest side has a steel plate fire escape-type landing, and stairs extend down the side of the building toward the southeast end of the building. On the northeast side of the building are double steel doors large enough to accommodate transmitters, relay racks and ancillary equipment.

At the end of the building near the tower, provisions were made for a bowl insulator for the connection to the folded unipole antenna. This was 20 feet above the tower foundation.

The building was constructed of weatherproofed concrete block, and the contractor poured the foundation solid with concrete up to the level of the transmitter room floor.

It was the purpose of this design by our firm to provide for safety of the transmitting equipment even though the river water level should extend as high as it had in Hurricane Agnes.

A -90-degree antenna tuning unit was mounted on the wall next to the

bowl insulator and connected to the ground strap in the floor trench.

Initially the 1 kW RCA transmitter was installed. A 250 W RCA auxiliary transmitter was later installed, along with RF contactors to transfer transmitters and dummy load connections.

I made bridge measurements in two stages. The tower rigger was available to locate the grounding stub on the skirt wires at the proper distance to bring the tower impedance to 50 ohms. Trial-and-error was used until the bridge indicated the closest practical values.

The frequency was measured from 10 to 30 kHz above the operating frequency in 5 kHz steps, and then from 10 to 30 kHz below the operating frequency in 5 kHz steps. When I was satisfied, the rigger made permanent connections to the tower.

While these measurements were done, the station was still on the air at 250 W from the hotel site.

After midnight during the experimental period, we shut down the 250 W transmitter and completed the bridge measurements. We did this at the operating frequency and again in 5 kHz steps above and below the operating frequency. This required 10 minutes of dead air.

The station returned to the auxiliary transmitter until 6 a.m., when the station signed on from the new site. Reception from the new site was outstanding.

Finally, the contractor buried the ground radials less than 6 inches deep using rich loam topsoil, and planted grass over the entire ground system.

City Island has since been transformed into a large city park, with a minor league baseball stadium, a miniature steam railroad, horse-drawn carriages, a nature walk and a riverboat landing. The station, WKBO(AM), is owned today by Dame Media and the transmitter site can still be seen from the main parking lot.

■ ■ ■

Jim Pinkham is a telecommunications consultant in Hudson, N.Y. He can be reached at JIMPINK@aol.com

Terk Works In the NYC RF Jungle

► PRO, continued from page 58

Pro, said Terk, is the amplifier design.

"With most amplifier designs, the signal from the antenna elements still pass through the amplifier even when it's unpowered. Therefore, when the amp is off the signal becomes greatly attenuated — to the point where you can virtually lose your signal.

"With this amplifier, there's a relay," Terk said. "So when you turn the amp off, the signal bypasses it and there's no signal loss. That's a very rare and unique design feature that allows the user to always bring in a pure signal."

Terk makes a surprisingly strong claim for the performance of the FM Pro.

"We tested it and compared it to outdoor (roof-mounted) antennas," he said. "Pleasantly, to my surprise, it outperformed most outdoor antennas. This antenna is as good as you get, FM-wise."

The FM Pro will not be sold in the average retail store. Terk is targeting it for sale by custom installers and high-end audio retailers whose discriminating customers will accept a large-size antenna as a price for superior performance.

"This antenna is for people with better FM equipment," said Terk. "To have a great tuner and not have a decent antenna is goofy. We want to sell this antenna to people who want uncompromising performance in their radio listening."

■ ■ ■

Terk Technologies, Commack, N.Y., can be reached at (516) 543-1900. Terk's website, which has information on the FM Pro antenna, is at <http://www.terk.com>

Frank Beacham is a New York City-based writer and producer.



You Must Remember This

The portable Zenith Trans-Oceanic — officially known as the "Zenith G500" — inspires memories of Atomic Age suburban America.

The flip-front, six-band AM/SW receiver featured "blender-style" band select pushbuttons underneath the collapsible whip antenna and a detachable Wavemagnet antenna for improved reception. The red slide switches were bass and treble boost/cut controls.

The Trans-Oceanic's tube circuitry could be run from a battery, which occupied 25 percent of the case. The wooden case was "tropic treated" with a wax impregnation process for damp environments.

Zenith produced 89,681 Trans-Oceanic radios from 1949 to 1951. This one, made in 1950, cost \$99.50 in 1950 dollars, or about \$650 today.

This is one in a series of pho-



tographs in RW featuring classic and less well known radios. The pictures and descriptions are by collector Bill Overbeck, president of the Delaware Valley Historical Radio Club, who has made every effort to insure accuracy. Contact him via e-mail at billoradio@aol.com or through RW.

Walkaway

Turn off the lights; lock the doors; go home. A few short years ago this level of automation at radio stations was impossible. But thanks to rapid advances in technology it's now an everyday occurrence. Anyone can go home, but to go home legally it takes specialized equipment. If you're contemplating a walkaway, you need to call about our RFC-1 Dial-Up Remote Control and our DAI-1 Dial-Up Audio Interface. For instant information 24-hours-a-day call our "Fax-On-Demand" from your fax machine and request documents 101 and 110.



SINE SYSTEMS
Voice: (615) 228-3500
Fax: (615) 227-2367
Fax On-Demand: (615) 227-2393

24 Hour **FAX-ON-DEMAND**

Circle (16) On Reader Service Card

World Radio History

USER REPORT

Omnia.fm Next Step in Processing

Jeff Goode

If you are still running analog audio processing or have been less than impressed by the sound of digital processors on the market, then you are in the same position we were in some time ago.

After disappointing results with first-generation all-digital processing, we reverted to our old analog gear a couple of years ago. We concluded that digital processing was not ready yet, and analog was better at creating a competitive loudness.

Earlier this year, Cutting Edge Technologies brought us a prototype of its new Omnia.fm digital processor for an on-air demo. The product won "Cool Stuff" honors from RW at the NAB convention this spring.

Same here

Frank Foti, creator of the Omnia.fm, explained that his engineers at Cutting Edge heard the same types of complaints from others about current digital boxes, compelling him to re-think completely digital audio processing.

In his view, earlier designs had fallen apart in several areas. First, their emulation of analog functions in the digital domain has not been easy. Whether analog or digital, the entire point of processing is to create the illusion of high fidelity for an analog ear while keeping the mod meter at 100 percent. Psychoacoustics is the key.

Another source of that "digital" sound, he said, is a sample rate that is set too low. The Omnia.fm has an internal sample rate of 48 kHz, allowing the DSPs to work at a higher speed and reducing aliasing products that occur at lower rates.

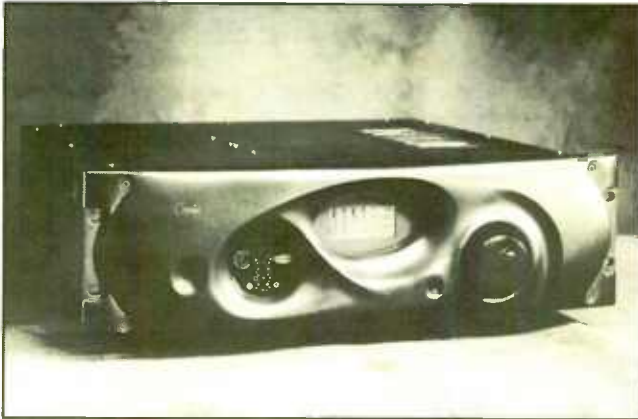
For shipping unprocessed audio over the link of your choice, 32 kHz may work fine, but is too low for artifact-free processing and filtering.

Omnia on air

Sales pitch and promises are one

thing, but the real test is on-air performance — how well instruments retain their character: pianos do not turn into harpsichords and cymbals stay musical without becoming "stones in a can."

An Omnia.fm beta unit arrived in June and we installed it in time to launch our new Oldies station, WGLD(FM), Indianapolis.



Signal processing evaluation is subjective, but our first reaction to this box was that it sounded analog. We were able to get to the sound we wanted quickly.

Sales pitches and promises are one thing, but the real test is on-air performance.

Compared to other digital or analog units, the Omnia.fm stands apart. Mid- and high-IMD is reduced, producing great clarity. Low frequencies do not modulate the highs and the bass EQ will let you push the bottom without muddying up the rest of the mix.

The stereo field is dramatic and

holds up under heavy processing. Instruments in the mix are brought forward instead of being buried in the grunge. Voice quality is excellent and the music/voice loudness balance is close.

The Omnia.fm is a system, consisting of a wideband AGC, Bass EQ, four-band AGC and four-band peak limiter with overshoot-controlled low-pass filters. I/O is either AES or L/R analog; a Composite output achieves better than 65 dB separation, all done in DSP. The Omnia is software-controlled, making later updates or revisions easy.

The stereo generator has a built-in composite clipper that works on the up-sampled digital signal, before down-sampling and final low-pass. The advantage is total protection of the SCA region and freedom from pilot modulation: The 19 kHz pilot is injected after the clipping stage.

The unit comes with several format presets that are good starting points. We chose one close to what we wanted and made only minor changes to get what we were after. A particularly useful feature is the block diagram display, which allows the user to visualize the effects of adjusting each element, and nearly every parameter is adjustable. Cutting Edge engineers say later versions of the User Mode will be limited, equipped with less fine tuning and decreasing the risk of bad adjustments.

So far, so good

I do not claim to be a golden ear by any means, but I have done my fair share of tweaking on all varieties of processors over the years in my quest to produce the best, most successful commercial sound that existing technology would allow.

Loudness gains are not to be had



anymore. Now the advantage to using digital processing is to achieve a markedly cleaner signal with fewer side effects. Of course, you could still turn up the volume, if that is what you want, but we are as loud or louder than most everyone in the market and without the distortion.

In our facility, we use the Omnia.fm composite output into a Moseley 606/C STL. Delay through the unit is minimal — on the order of 6 ms — and our jocks have had no problems with direct off-air monitoring.

Being computer-based, the system takes some time to initialize. Running it on a UPS is mandatory unless you can tolerate 15 to 20 seconds of dead air after a power blip.

In the three months since it has been in use, we received one factory update that corrected some minor software problems discovered in beta testing.

The one complaint I have with the unit is, that to achieve an acceptable loudness level, it seems to rely on the composite clipper a bit more than I would like for this market.

Cutting Edge has produced a processor with the best attributes of analog while using digital to overcome analog limitations. Digital audio processing should give users the capability to do everything that analog does, while creating an aggressive, commercial air sound. The Omnia is a powerful tool towards that goal.

■ ■ ■

Jeff Goode is the Assistant Chief Engineer for FM stations WFMS/WGRL/WGLD in Indianapolis.

For more information about the Omnia, contact Cutting Edge Technology in Ohio at (216) 241-3343 or circle Reader Service 6.

ALTRONIC RESEARCH INC.

Performance By Design



MANUFACTURER
OF RF COAXIAL LOAD RESISTORS.

DUMMY LOADS FROM 1 KW TO 1500KW,
AVAILABLE IN AIR, WATER OR SELF
CONTAINED HEAT EXCHANGERS.

HIGH POWER NON-REACTIVE CERMET
RESISTORS FROM 1 OHM TO 20 MEGOHMS.



ALTRONIC RESEARCH INC.

P.O. Box 249 • Yellville, Arkansas 72687 870-449-4093 • Fax: 870-449-6000
E-mail: altronic@mtnhome.com Web Site: <http://www.altronic.com>

Buyer's Guide

FM Transmission
Products
See Page 68

Radio World

FM Transmission & EAS

October 15, 1997

SPECIAL REPORT

FM: On a Wave Toward Digital

W.C. Alexander

FM transmitter designs have come a long way from the early days.

Clunky, hot, noisy boxes were prevalent in the 1950s and 1960s. It was quite a task to produce the power levels required at VHF frequencies. Design considerations that were insignificant at AM frequencies, such as lead inductance and distributed capacitance, meant everything at VHF frequencies.

It was a real challenge to design and construct a power amplifier (PA) stage that was not prone to oscillation. The $\pm 2,000$

Hz frequency tolerance that seems as broad as a barn door today was sometimes difficult to maintain just a few years ago. Even the automatic frequency control (AFC) circuits we had back then were hard-pressed to keep signals within that window.

Improving with time

As time passed and technology improved, innovative designs appeared. Engineers developed stable and efficient power amplifiers, improving tube life and lowering operating costs. Solid-state

exciter designs jumped generations beyond earlier tube-type designs.

Phase-locked loops (PLLs) replaced AFCs, making it easy to nail the assigned frequency



Powered by an alternative energy source, the KFMU-FM tower in Oak Creek, Colo., rises above the trees.

and keep it locked. Modulated high-frequency voltage-controlled oscillators (VCOs) provided improved linearity and better noise. PLL synthesizer noise, however, was a new problem, but slow time-constant filters generally suppressed this noise.

New transmitter designs led to improvements in control circuits and more user-friendly operation. Older 120-volt AC

See FM, page 67 ▶

SBE Asks FCC for EAS Changes

Lynn Meadows

Last month, the Federal Communications Commission issued a notice of proposed rulemaking on the 11 suggestions to improve EAS put forth in a petition by the Society of Broadcast Engineers.

The changes would affect local emergency management equipment or consumer receivers while making the broadcaster's life a little easier.

"Stations should not have to purchase additional equipment. At the very worst, new software PROMs may be required to affect these changes," said Leonard Charles. He is on the SBE board of directors, and is the SBE EAS committee chairman and the information systems administrator for WISC-TV in Madison, Wis.

After the EAS system was implemented on Jan. 1, the SBE began accepting suggestions for improving it.

"Some start-up problems have already lost EAS critical support that will be hard to regain in some quarters," states the petition the SBE submitted for EAS rules changes. "Since January 1st, the SBE membership has been forwarding to its EAS Committee instances of questionable operation of the EAS in various parts of the country."

No new equipment

In response to an e-mail referring to this story, Charles wrote that broadcasters are not interested in purchasing more equipment for EAS. At the most, he said, more receivers may need to be purchased.

Any additional receivers outside the two required by the current rules would be the result of local emergency plans, Charles explained. Though not required in most localities, the National Weather Service (NWS) is one signal many stations monitor.

Stations may also end up buying a receiver to monitor the local 911 call center or local emergency dispatch center; both often use background frequencies. Charles said the price paid for these receivers depends on what the station wants.

The first three changes proposed by the SBE would simplify EAS procedures for broadcasters.

First, "in an effort to keep the

See SBE, page 63 ▶

FM and EAS Refinements

Looking to upgrade your FM RF plant or getting ready for a power increase? Is your EAS equipment doing everything it should be? We answer these questions in this month's *Buyer's Guide*.

Texas engineer and *RW* writer Cris Alexander spoke with manufacturers producing FM transmission equipment; he reports on trends in that segment of the industry.

In a series of Tech Updates, we target the FM transmission equipment your station needs, from the exciter out to the big box itself.

The national SBE has petitioned the FCC to review the current EAS standards and make some changes. Lynn Meadows interviewed SBE EAS Committee Chairman Leonard Charles. She explains the proposed SBE changes and the impact they will have on broadcasters and manufacturers.

Suppliers tell us that radio stations continue to buy EAS gear, even though the deadline to have hardware in place is months past. Look for a comprehensive guide to EAS equipment — what is offered beyond the FCC standard features.

— Susan Gary



HU-961
EAS Encoder/Decoder
from HollyAnne Corporation—
Your Digital Warning Industry experts
for more than 12 years

IN STOCK—
AVAILABLE TO
SHIP NOW!

COMPLY FOR LESS*

with the HU-961
EAS Encoder/Decoder

from HollyAnne Corporation

Complete compliance for less

We have **everything** you need to be compliant with EAS rules. Unlike competitors' prices, ours includes **complete** packages.

AM/FM and weatherband radios are also available separately at reasonable prices.

Features:

- ▲ FCC-required digital voice storage is standard (**not** optional) and with all our standard features, we'll *still* save you hundreds of dollars.
- ▲ While the HU-961 is programmed on a computer, a computer is **not** necessary for operation (programming is available). Voice prompts make both programming and operating very user-friendly.
- ▲ You can monitor functions on any 286 or better computer, using its large-screen format instead of other systems' hard-to-read on-board displays.
- ▲ Receive, store, retransmit & initiate EAS messages from up to 3 monitoring

*Save more than half off other systems' prices



Call toll free: 1 - 888 - 4EAS - INFO
(1 - 888 - 432 - 7463)

Circle (94) On Reader Service Card

World Radio History

SBE Petitions FCC

► SBE, continued from page 62

annoyance of testing the EAS from detracting from its acceptance," the SBE requested that a quarterly test replace the monthly test and a 60-minute relay window replace the current 15-minute window.

Second, the SBE suggested that the FCC remove the two-tone attention signal requirement except in "areas where there exists consumer receivers set to demute on reception of this two-tone attention signal from a broadcaster."

These receivers are in areas like those surrounding nuclear power plants, Charles explained. Without the two-tone, those receivers would be useless. However, in areas where there are no such receivers, elimination of the two-tone will result in a "shorter and more palatable message format," the SBE wrote.

Third, the SBE proposed a reduction of the 80 percent modulation level mandated for EAS tones to 50 percent. To attain the mandated 80 percent modulation level, Charles said, the tones would have to be inserted after station processing — a procedure that the SBE states is "adverse to acceptable engineering practice."

Learning from mistakes

The fourth proposal relates to manufacturing options in EAS boxes. Many boxes do not authenticate the location for an Emergency Action Notification (EAN) since the rules say it is supposed to be broadcast immediately.

Recently, this resulted in an EAN message intended to test a Chicago PEP (Primary Entry Point) station being relayed by stations in Florida, Louisiana and Ohio. The SBE would like to see the boxes verify the location code for EAN messages like they do for other messages.

"While it is true that the EAN was developed to deal with an imminent nuclear attack, the evolution of the world's societies have lessened the likelihood of such an incident, but have increased the likelihood of terrorist activity," reads the petition. "Such an event would fall under the jurisdiction of a national government agency but not threaten the entire country and so the need exists to alert selective locations from a national activation point."

Text capability

The fifth proposal from the SBE was the addition of a protocol for text transmission.

Charles said the impetus for this came from both the hearing impaired and broadcasters who need more space to give information. The only new equipment for such a proposal would be the burden of the message originators — most likely government agencies, many of which have not purchased equipment yet. The text, which would come after the EOM (end of message) bit, would output to a printer or to a captioner for television.

Charles said they encountered a situation in Wisconsin where the LPT1 stations were an AM/FM co-owned, co-located combo that share one encoder/decoder.

At the time of the required monthly test (RMT), the AM station sent one test,

followed two minutes later by a test on the FM, but with a different time stamp. This resulted in one station in the market broadcasting the RMT two times within five minutes.

The SBE petitioned the FCC to mandate that in the case where more than one co-owned and co-located stations are designated as key stations, the equipment be configured so that the other key station(s) simulcast or relay the origination of one of the key stations. Since an originating box cannot also relay the same message, the solution here will be to simulcast the same message or to buy another box.

Another element in the petition requested

that in some circumstances, the FCC allow the airing of crawl-only EAS messages on television without interruption of normal program audio. The organization also asked that any time a station must carry a presidential message live during an emergency, it is able to use a source other than the EAS source.

Come back, EAN

The SBE urged the restoration of the EAN Network, which previously used the networks and wire services to forward national alerts and also asked the FCC to include cancellation codes for all event codes, including the codes it should be adding soon.

In its final point, the SBE asked the FCC to coax participation in EAS at the local level. One suggestion was to encourage consumer receiver

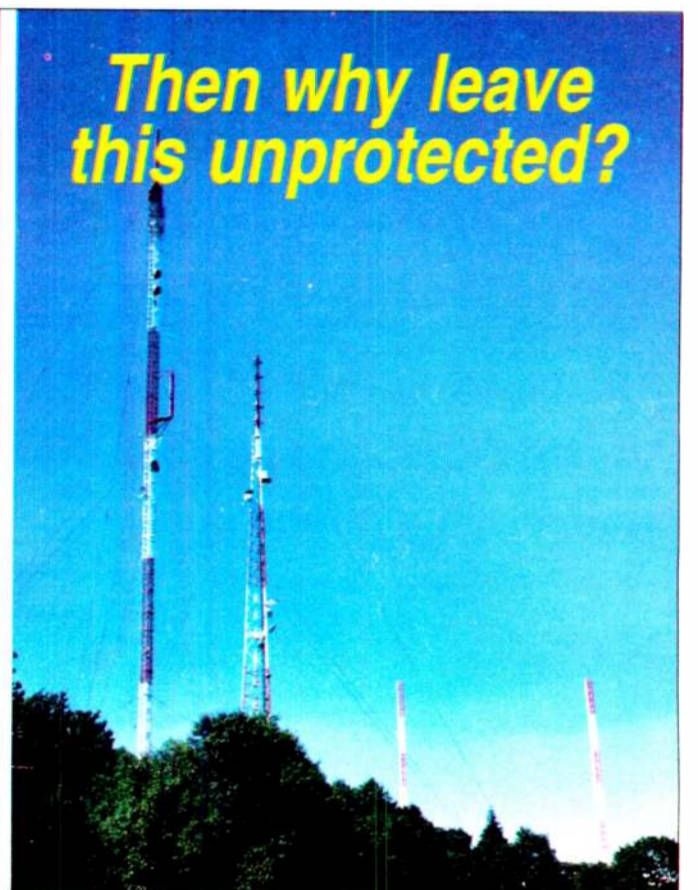
manufacturers to incorporate scanning EAS decoding chips in their designs and consider copying the process used in mandating closed captioning to require these EAS chips be installed in receivers.

Charles said the idea is for the chips to listen for EAS headers and automatically turn to the channel when it hears one. However, he said, the chips are "a mystery" because one has not been designed yet.

Comments are being accepted with regard to these proposals at the FCC. Again, the SBE does not believe more hardware or equipment will be necessary. "We believe everything we have written is a software fix," said Charles.

■ ■ ■

If you would like to comment on the petition to RW, e-mail sgary@imaspub.com



WHR Series **STABILINE**® Voltage Regulators for radio and television broadcasting installations.

Superior power conditioning to safeguard your business investment.

All delicate electronic devices, including your station transmitters, are designed to perform within a certain voltage range.

More often than not, however, the voltage that reaches your critical operating equipment is highly inconsistent or "dirty" because of power line disturbances like sags, surges, spikes and brownouts. And dirty power can wreak havoc with your broadcast system, mobile production vehicles or remote transmitter sites causing equipment malfunction, hardware/software damage or reduced power tube life.

Don't become a victim of polluted power lines!

Cost-effective WHR Series STABILINE® Voltage Regulators prevent power quality problems from attacking your vulnerable electronics. The preferred choice of broadcasters worldwide for use with transmitters, receiving stations, studios and mobile production units, these high power regulators automatically feed voltage sensitive equipment a constant voltage level — even when the power line input voltage and system load vary widely. STABILINE® — the preferred choice of broadcasters worldwide.



3-phase, 500 kVA model.

The industry's most extensive list of standard options and features:

- Output voltage maintained to $\pm 1\%$
- Power ratings from 2 to 1680 kVA
- 99% typical efficiency
- High overload capacity
- No waveform distortion
- Maintenance bypass switch
- High energy transient suppression
- Zig-zag neutral generation
- Input voltage range alarm contacts
- Frequency trip meter and ammeters
- Analog or digital control
- Single or individual phase control
- Single or three-phase models
- 19-inch rack mount versions
- All voltages up to 660 V
- Tropicalization treatment

For catalog or more information, call, write or fax Ted Gladis.

SUPERIOR ELECTRIC
WARNER ELECTRIC

383 Middle Street
Bristol, CT 06010 USA
Telephone: 860-585-4500
Fax: 860-582-3784
1-800-787-3532 in USA & Canada



Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No. (s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

NEW! S-102A 10x1 Stereo Audio Router



The S-102A is a low cost, broadcast quality 10x1 routing switcher, with all the features demanded by professionals:

- Local or remote control
- RS-232/RS-422 control port
- Balanced audio inputs and outputs
- +24 dBu maximum audio levels
- Front panel audio level controls for every input and output
- Two buffered outputs for each channel

Broadcast quality throughout. No compromises.

Please call for a complete catalog of Videoquip products.

VIDEOQUIP
RESEARCH LIMITED

(416) 293-1042 Fax: (416) 297-4757 www.videoquip.com

READER SERVICE NO. 34

Send up to 65,000 Faxes in a day!



- Simple to install
- Simple to operate
- Installs in a stand-alone PC
- Does not require a network
- Works with any fax list
- Print various activity reports

FlashFAX™ Software: \$895
FlashFAX™ System: \$3,995

(Includes complete Rack Mount Industrial Computer System with more than 2,000,000 page capacity, high-resolution color monitor, 4 intelligent (high-speed) fax ports-upgradable to 32 & FlashFAX software)

Highspeed Networks, Inc.
Tel.: 972-231-6300 Fax: 972-231-7221

READER SERVICE NO. 73

POWERFUL DIAL-UP CONTROLLER



The CircuitWerkes DR-10 Dial-up controller is perfect for studio & automation control.

- ▶ 10 dry relay contacts out (2 are DPDT for switching bal. audio, etc.)
- ▶ Auto-answers on settable ring # and auto-disconnects with telco CPC.
- ▶ Each relay can be assigned to any tone & can be set to function as momentary, latching closure with distinct on/off codes, or interlocked latching with other relays. Any relay can be assigned to any tone(s).
- ▶ Up to 8 digit user set password prevents pirating.
- ▶ Each relay is programmable to close at beginning or end* of tone and can beep when activated. End of tone closures are after the beep!
- ▶ Two-tone & detection delay modes eliminate falsing for remotes, etc.
- ▶ 4 Status inputs beep when queried, dial 4 numbers & control relays.
- ▶ A simple, built-in audio hybrid, with active, balanced input & outputs, lets you control your equipment while monitoring local audio sources.
- ▶ All audio & control connections via easy to use screw terminals.
- ▶ Retains its settings & prior state after a power failure.
- ▶ Silencer option removes DTMF tones from output.
- ▶ List price only \$449.00. Compare our features & price to anyone else!

The DR-10 can do a lot more than space allows us to print. For complete info & downloadable manuals, check out our web site - <http://www.circuitwerkes.com/> *end of tone closures function in momentary mode only.

CircuitWerkes - (352) 335-6555 / Fax 331-6999
3716 Southwest 3rd Place, Gainesville, FL 32607

READER SERVICE NO. 33

The best way
to **release** the great sound
trapped in a phone line...

Zercom
CORPORATION

You can spend more, but you can't get better analog sound for only \$455.00!



The Zercom 'ZH-2' Telephone Hybrid

P.O. Box 84, Zercom Drive
Merrifield, Minnesota 56465-0084
218/765-3151-Fax 218/765-3900

Available through all major dealers

READER SERVICE NO. 112

Telephone Couplers



Passive: Model TCB-1

Send or receive audio over the phone line with small, convenient Comrex couplers.

- Passive coupler \$150
- Auto Answer coupler \$250
- FCC Registered



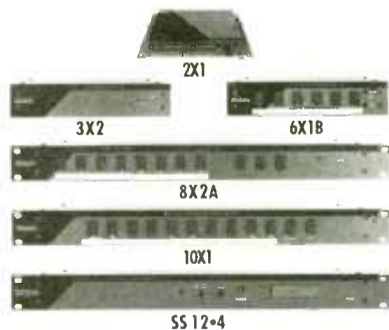
Auto Answer: Model TCB-2

COMREX® Comrex Corp, USA

Tel: 508-263-1800 Fax: 508-635-0401
Fax-on-Demand: 508-264-9973 (Doc #110)

READER SERVICE NO. 72

Broadcast Tools Has The Right Switcher For You!



From the 2X1 that switches between two stereo sources feeding a single stereo output, to the microprocessor-controlled SS 12*4 with twelve stereo inputs feeding four stereo outputs, we have a switcher to fit your application. Designed by broadcast engineers for broadcasters, our switchers offer excellent audio quality, removable I/O connections, remote control capabilities and flexible mounting accessories, plus most models can be used as source routers. For your next project use the right tools - Broadcast Tools!

Check out our new web site for additional information and a list of distributors!

Voice: 360 428 6099 **BROADCAST TOOLS**
Fax: 360 428 6719 **INC.**

E-mail: bti@broadcasttools.com Internet: www.broadcasttools.com

READER SERVICE NO. 111

1000 HITS ON HARD DRIVE \$495!

HBS
HALLAND BROADCAST SERVICES, INC.

1289 East Alosta Avenue
Glendora, CA 91740 USA
PH 626-963-6300
FX 626-963-2070

Music on CD also in stock!
Song lists on the Internet
<http://www.h-b-s.com>

1-800-HALLAND
1-800-425-5263

READER SERVICE NO. 113

Don't waste time dubbing music!

Halland will dub 1,000 songs of your choice for only \$495!

Pick from our inventory of Oldies, '70s-Gold, Classic Rock, AC or Country. One-day service no extra charge!

32K, MPEG-II, .WAV files compatible with:

Arrakis, BSI, Enco, Pristine, Prophet Systems, Register Data, Smarts and others.

A DIVISION OF
HE HENRY
ENGINEERING

TARGET: EAS

EAS: Some Are Still Choosing

EAS equipment now is a reality in most radio stations, where managers have moved past the purchasing decision and on to training and implementation problems. But there is still a market for equipment. Vendors say some stations still don't have their gear. Other stations tried one or two systems before settling on a third. Here's a quick rundown of the products available, with info. on features and options.

BURK TECHNOLOGY

Massachusetts
 Phone: (800) 255-8090
 Phone: (508) 486-0086
 Fax: (508) 486-0081
 e-mail: control@burk.com
 Circle Reader Service 20



Features

Full numeric keypad built-in; self-contained weekly test confirmed by pressing one button, built-in memory allows user to customize weekly test; designed to be tailored for user's needs; memory allows pre-recorded outgoing message for forwarding; built-in printer for recordkeeping.

Options

RX-4 Monitor Receiver System designed to complement the Encoder/Decoder includes four receivers that meet most plan requirements; digital tuning locks frequency to eliminate receiver drift; designed to withstand high RF with no loss of sensitivity or performance; may be chained for standby.

LX-4 EAS Audio Switch program interrupt allows four discrete program channels, each individually adjustable; transparent on the air chain; can be located as much as 300 feet from the EAS Encoder/Decoder; can switch two stereo or four mono air chains separately or together; two units can be stacked to increase capacity.

GORMAN-REDLICH MFG.

Ohio
 Phone: (614) 593-3150
 Fax: (614) 592-3898
 Website: www.gorman-redlich.com
 Circle Reader Service 137

Features

Five bi-directional RS232 inputs/outputs for computer modem, remote sign board, character generator and auxiliary panel; automatic interruption of stereo program lines by built-in relays; two minutes of digital audio storage (5 kHz) expandable to 4.5 minutes; five programmable relays to supply contact closures; auxiliary output through coaxial BNC fitting to go directly into FM exciter; 4-line, 40-character backlit LCD display, message can be scrolled on remote sign board, computer screen, or video monitor; diagnostic information can be printed and faxed to manufacturer for analysis; 2-1/2 inch, 8-ohm front panel QUAM speaker for clear audio; non-volatile memory, voice storage; four-layer board with all signal traces on top and bottom, all ICs mounted in sockets; includes CMOS EPROM 32-pin DIP 1 MB for future changes.

Options

Manufacturer will program EAS1, based on user's answers to a questionnaire for charge of \$50. Optional accessories available: CRW weather receiver, 6-element

Yagi antenna, whip antenna, dot matrix parallel printer, double shielded cable (6-foot, 10-foot), crystal-controlled FM radio, sign board, opto-isolators for remote control lines.

HOLLY ANNE CORP.

Nebraska
 Phone: (888) 4EAS-INFO
 Phone: (308) 428-4841
 e-mail: SAM@SYNERGY.Net
 Circle Reader Service 59

Features

EAS Encoder/Decoder can be programmed to alert-only preselected messages; interfaces with automated

broadcast stations; requires 286 or better computer for programming; computer software, which is password protected, prompts programmer through set-up procedure; contains three audio inputs and one RW-232 1,200 ASCII data input; capable of automatic or manual operation, in both



modes, incoming digital messages are stored internally, in an external computer or printed on an external printer for review; contains internal voice message which alerts personnel audibly through

front panel mute-enable speaker; external light or other signaling device is available; all functions can be monitored via computer.

Options

The HU-961 is Specific Area Message Encoding (SAME) compatible.

The RR-962 radio receiver module can be connected to the HU-961 and includes digitally tuned AM, FM and/or Weather band radio boards, meets FCC requirements.

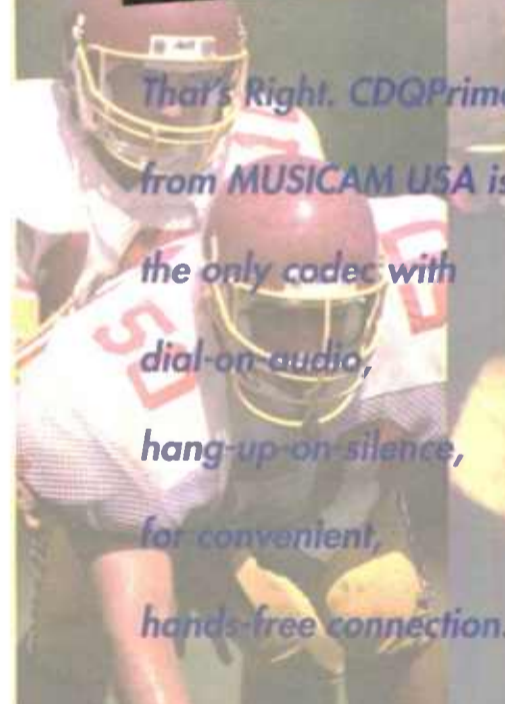
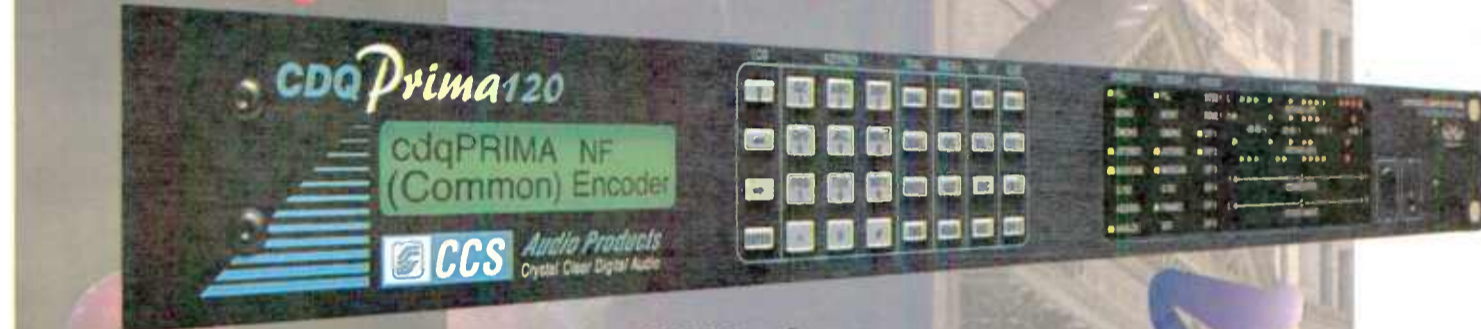
MTS SYSTEMS

North Carolina
 Phone: (919) 553-2995
 Website: www.mts-comm.com
 Circle Reader Service 98

Features

One RU box contains five EAS inputs; See EAS, page 67

For Superb Sound, Press None



CDQPrima from MUSICAM USA delivers what you want most in a digital audio codec: Superb Sound. Simple to set up and operate, CDQPrima has on-board intelligence that automatically recognizes the calling codec, set bit rates and operating modes - even operate remote equipment at the far end.

AND THERE'S MUCH MORE

Superior compression algorithms that deliver unparalleled crisp, clear sound

Maximum compatibility with Layer II, Layer III and G.722

256 Automatic presets and quick configurations built-in

AES/EBU digital audio input/output module with sample rate conversion

Up to three integrated ISDN Terminal Adapters

Full contribution quality at up to 384 kb/s

ISO 9002, CE, UL1950 certified

PLACE YOUR ORDER NOW!



MUSICAM USA

670 North Beers Street, Building 4, Holmdel, New Jersey 07733 USA
 Tel: 732/739-5600 ask for ext. 163
 Fax: 732/739-1818 • Fax On Demand: 732/935-2777

E-mail: sales@musicamusa.com
 Internet: <http://www.musicamusa.com>

Circle (172) On Reader Service Card

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

Excalibur Electronics HC-1 Handi-Coupler



Here is the simplest, quickest, most convenient way to connect audio to a telephone. The HC-1 connects in series with the handset of any phone using modular connectors. No connection to the phone line is needed. Press the front panel button and external audio is available on separate send and receive 1/4" TRS jacks on the rear panel. Release the button and the handset is once more connected for normal use of the phone. Nothing could be simpler!

You can find many uses for the HC-1 around your station: on-air studio, production room, newsroom, sales office, field news kits, sports remotes, etc.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA
Please circle our bingo number for a data sheet and a dealer list

READER SERVICE NO. 32

THE COST EFFECTIVE ALTERNATIVE TO MANUFACTURER SERVICE

SERVICE, REPAIR & CALIBRATION

- STL's • RPU's • TSL's
- Exciters • Optimods
- AM/FM Monitors
- Remote Control Systems

SPECIALIZING IN EQUIPMENT BY

- Belar • Marti
- Moseley
- McMartin
- TFT
- And others...

WE ALSO PROVIDE

Free, over-the-phone technical assistance
STL loaner/rentals
PCL 505 Certification



2198 Hubbard Lane, Grants Pass, OR 97527

(541) 471-2262

READER SERVICE NO. 71

Look At Systems Design With A Fresh New Prospective & Limitless Tools



Specialists In Practical Precision Engineering

USA Phone (800) 281-2683 Europe Phone (+31) 20-6238 983
USA Fax (805) 684-9316 Europe Fax (+31) 20-6225 287
Internet Access: www.rdlnet.com

READER SERVICE NO. 31

Affordable Custom Broadcast Furniture



2 Pennsylvania Avenue, Malvern, PA 19355

Delivered and
installed by

STUDIO
TECHNOLOGY

TEL: 800-676-0216

FAX: 610-296-3402

email: Studiotec@aol.com

READER SERVICE NO. 110



Econco REBUILT POWER TUBES



Approximately One Half
the Cost of New

3,000 Hour Unconditional Guarantee

Call for Our Price List

Econco 1318 Commerce Ave. Woodland, CA 95695
Phone: 916-662-7553 Fax: 916-666-7760 Telex: 176756
Toll Free: 800-532-6626 From Canada: 800-848-8841

READER SERVICE NO. 70

HIT THE ROAD, JOCK!

Produce and run your show
On Location **EXACTLY** the way
you would from your studio!

THE MITS ROADSHOW SYSTEM

The first and only system
that lets you use and control
your multi-line phone system
from your remote broadcast
location. Includes full status
and control of up to 15 lines,
LCD "screener" call data
display, 5 ACTION KEYS
for remote control functions
and much more!



Take control of your phones! CALL:

Broadcast Telephone Systems



email: info@innovadev.com
web: www.innovadev.com

1-888-890-7424

Innovative Devices, Inc.

READER SERVICE NO. 30

NEW LOW COST FM TRANSMITTERS & POWER AMPLIFIERS



PRICES

Exciters	Power Amplifiers
10W.....\$1375	150W.....\$1,815
	300W.....\$2,750
	500W.....\$3,663
	1000W.....\$7,326

All of the above need just 10W drive

**CALL 408-448-3342
FOR DETAILS**

READER SERVICE NO. 109

Transmitters Continue Evolution

► FM, continued from page 62

control ladders were replaced with 24-volt DC controls, which were easily adapted to remote control.

As remote control technology improved, transmitter control circuits continued to improve and adapt, providing status outputs from transmitter control states, overloads, alarms and so on.

Operators, either locally or by remote control, could observe the status of the transmitter at a glance and determine what, if any, corrective action was needed. Interpreting meter readings and determining problems no longer took extensive training.

Better and better

Some manufacturers took their control circuits to a higher level, employing microprocessor circuits that provided operators with complete conditional and diagnostic information. These transmitters had a port for a keyboard and video monitor, in addition to the usual remote control interface terminals.

In the last few years, surface-mount technology (SMT) has had a big impact on FM transmitter design. Utilizing tiny "no-hole" surface-mount parts, manufacturers were able to produce complex cir-

cuitry in a very small space. This ability also virtually eliminated lead inductance, which was a real problem with the old "three-hole" technology.

Component-level troubleshooting has been nearly eliminated by SMT. Replacing an entire circuit card is much simpler and usually more cost-effective than poking through a multi-layered SMT board and locating the exact fault. Some stations may elect to equip themselves with SMT benches, but in most cases, this represents an extravagance for which the cost can never be recovered.

Jeff Detweiler, sales manager for QEI, said that SMT assemblies were not used in broadcast transmitters and exciters for years because of the relatively high development cost and low quantities involved.

"A good-selling exciter, for example, might only have a production run of a few hundred units, and in those numbers, it is hard to recover the cost of SMT assembly development. Outsourcing, however, has made SMT usage more palatable," said Detweiler. "We can look for more SMT assemblies in future transmitter designs."

Highs and lows of solid state

Lately, solid-state FM power amplifiers have found their way into many lower-

power (10 kW or less) FM transmitters.

Most solid-state PA designs are broadband rather than tuned so efficiency is not as high as one might expect. Using tuned PA circuits increases efficiency, but the operation of tuned circuits makes use of a single solid-state PA over the entire FM band impossible.

However, most tuned PA models can be moved to different parts of the band by changing only one or two components.

Solid-state PA device efficiencies are higher than their tube counterparts, but combiner losses tend to make the overall efficiency lower than some of the more impressive efficiencies achieved in solid-state AM transmitters. Below 5 kW, overall efficiencies are better than tube-PA transmitters; above that

power level, efficiencies are comparable.

The main advantages of solid state are component life (indefinite for transistors as opposed to a year or so for a tube) and built-in amplifier redundancy (most solid-state designs can continue to operate even with one or more module failures).

The hurdles that designers face in solid-state FM PA engineering include combiner loss and single-component power rating. If a breakthrough is made in either area, economical solid-state FM transmitters in much higher power ranges are probable.

Tim Bealor, director of RF Systems for Broadcast Electronics, said that while users are asking for higher power levels in solid-state FM transmitters, there is little development going on right now in the area of high power solid-state devices that work in the VHF region. "Broadcasters represent a very

See FM, page 68 ►

Got Yours Yet?

► EAS, continued from page 65

three internal receivers for AM, FM and National Weather Service; one RS-232/EAS serial I/O; digital audio recorder and player with 15 kHz bandwidth and hours of storage time; built-in computer; operates from front-panel keypad or PC keyboard; uses front-panel display or external monitor; parallel printer port; internal log records all EAS events for 12 months; digital controls for automation and/or remote-control interface; eight uncommitted inputs; eight outputs; four uncommitted user-programmable relays; mute input for live studio mic; multi-lingual voice-prompted user interface trains operators.

SAGE ALERTING SYSTEMS/ HARRIS CORP.

Harris is the exclusive distributor for the Sage Endec.

Indiana

Phone: (800) 622-0022

Fax: (317) 966-0623

website: www.broadcast.harris.com

Circle Reader Service 176

Features



Three programmable relays for control and switching; two minutes of digital audio storage; withstands extreme temperatures, humidity, power line voltages, high RF; simultaneously monitor six external sources; three modes of operation: manual, semiautomatic, automatic; automatic delay of received audio; XLR connectors and relays for main program audio pass-through and interrupt; internal speaker, which can be muted; messages displayed on front panel, connected PC or LED sign; password accessibility; mic and line inputs.

Options

RP-2 Multi-Station Relay Panel

(MSRP) allows three additional stations to be controlled from a single ENDEC. Another optional accessory is the RC-1, a remote control device that, when combined with the RP-2, makes message origination or retransmission on multiple stations sequentially or simultaneously. The EAS ENDEC receiver allows for as many as three plug-in modules, providing as many as six individually controlled audio outputs.

TFT

California

Phone: (800) 347-3383

Phone: (408) 727-7272

Fax: (408) 727-5942

Circle Reader Service 136

Features

Combined encoder and decoder that responds only to user pre-selected messages and forwards only certain messages



automatically; Part 11 compliant; compatible with NOAA Weather Radio SAME (Specific Area Message Encoding) Code; scans two required audio inputs expandable to four inputs; two RW-232 interfaces that are expandable to six; unattended operation is possible; front-panel logging printer; built-in, 2-minute digital voice storage.

Options

External LED message signs; video character generator and RBDS generator available; audio input expander allows two additional audio channels to be scanned; four-port COM expander allows unit to interface with a variety of external devices via RS-232 connections.

Auxiliary equipment includes the EAS 930 Multi-Module Receiver, EAS 940 Program/Transmitter Interrupt Unit, EAS 941 Remote Control/Status Module, LED Message Sign

Quantum FM

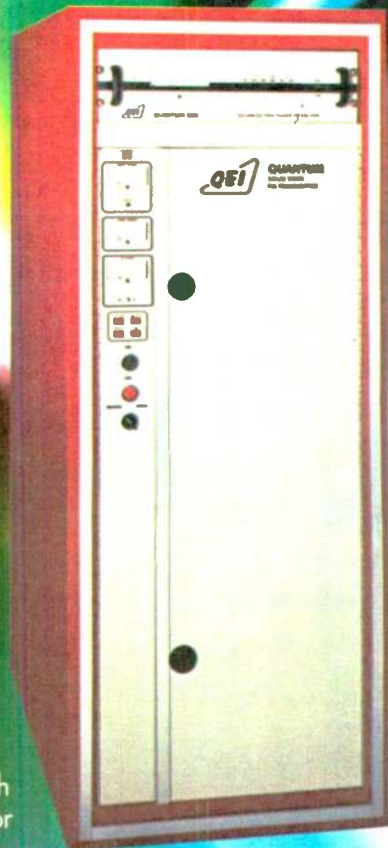
Solid
State

Solid
Reliability

from



- Proven reliability
- Maintenance-free FET technology
- Self-contained modules with own power supply regulator
- Compact size reduces shipping costs, allows affordable air shipment
- Power levels between 300 Watts and 6 kW
- Modular design offers buy-only-what-you-need affordability and convenience



For the same price you pay for a tube transmitter, you can now have a superior solid state FM transmitter with high-power, advanced technology exciter and cableless combiner. The modular design of QEI's QUANTUM-Series FM transmitters offers the advantage of buying only the amount of power you need...and means that you can upgrade to higher power levels whenever you're ready.

QUANTUM from QEI-the people who have been designing and building solid state transmitters longer than anyone else in the industry.

You need to know more! Call Jeff Detweiler today toll free

(800) 334-9154.

QEI Corporation
One Airport Drive • P.O. Box 805
Williamstown, NJ 08094

Tel (800) 334-9154
Fax (609) 629-1751

24-Hour Service Hotline
(609) 728-2020

TARGET: FM TRANSMISSION

Clean, Powerful, Punchy FM

Whether you prefer tube or solid-state, low power or high power, the choices in FM transmitters and exciters are wide. Manufacturers know that engineers are looking for equipment that is power-efficient, easily serviceable and with the best possible audio quality. Nowhere is this more true than in the transmitter rack, where resides perhaps the most critical piece of equipment in the entire FM radio station.

These companies responded to requests for information from **RW**.

ARMSTRONG TRANSMITTER CORP.

The FM-5000T 5 kW FM transmitter from Armstrong Transmitter Corp. employs motorized tuning and loading controls and advanced overload and recycle circuitry.



The transmitter is remote controllable and has a built-in low-pass filter and directional coupler. The RF power output is 1 kW to 5.5 kW.

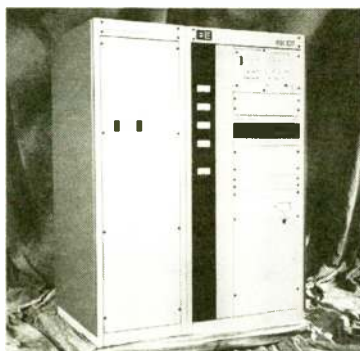
The transmitter is broadband and

contains a stable grounded grid RF amplifier. Cooled by forced air, the transmitter requires 208 to 240 V and 60 Hz, three-phase power, with single phase available on request. It also features an automatic recycle after power loss or overload conditions.

The transmitter cabinet is on wheels for mobility.

For more information, contact Armstrong Transmitter Corp. in New York at (315) 673-1269; fax: (315) 673-9972 or circle Reader Service 24.

BROADCAST ELECTRONICS



The new T-series line of FM transmitters from Broadcast Electronics includes an enhanced controller capable of monitoring transmitter functions. MOSFET technology is used in

the new IPAs at 20 kW and above, while high-power exciters eliminate the need for an IPA below 20 kW. The true proportional VSWR foldback protects the transmitter under all antenna load conditions.

Within this series, two upgrade option kits also are available for older A and B series FM transmitters. The first kit, for FM-5 and FM-10 A or B-series transmitters, is an exciter

replacement consisting of the FM-250C transmitter and connecting cables.

The second kit is the controller replacement kit, which includes the new T-series controller and an FM-250C transmitter, plus a new 500 W driver and all connecting cables. Kits are also available for the FM-20, FM-30 and FM-35 A or B series transmitters and include a new RF 500 W modular driver and connecting cables.

For more information, contact Tracy Peterson in Illinois at (217) 224-9600; fax: (217) 224-9607 or circle Reader Service 25.

See FM TRANSMISSION, page 69 ▶

Future Transmitters

▶ FM, continued from page 67

limited market and the investment of development capital is simply not justified for a product for which there is limited demand."

While it is possible to combine several 10 kW PAs to create 20 or even 30 kW, the cost can double or triple that of a comparable modern tube PA transmitter.

Gary Manteuffel, manager of broadcast sales for Nautel, said that "almost exclusively, broadcasters are purchasing solid-state transmitters in the 5 kW and under range."

He said that the initial cost difference is much more of a consideration above 5 kW. He also said that he continues to be surprised, however, at the number of broadcasters willing to pay a premium price for a solid-state FM transmitter at the 20 kW level.

Other RF manufacturers contacted for this story did not return calls or declined to comment.

Digital is the way of the '90s, and is most assuredly the way things will be in the future.

The creation of all-digital FM exciters created a groundswell that has been driving industry demand ever since.

Most manufacturers now offer all-digital FM exciters. These units employ direct

digital synthesis to create and modulate the FM carrier signal.

With advanced exciters, it is possible to plug in an AES/EBU input and not go back to analog until the FM-modulated carrier comes out the exciter output port.

Distortion, noise, non-linearity and other problems that manufacturers have worked for years to overcome are no longer factors. The resulting demodulated audio that the listener hears is cleaner, more consistent and has better stereo separation than analog technology ever achieved.

Broadcasters will have to decide for themselves, however, whether the benefits of an all-digital exciter are worth the added cost.

For the past decade, the thought of digital audio broadcasting (DAB) has never been far from the minds of most broadcasters. DAB technology, in whatever form it may finally materialize in this country, holds the promise of CD-quality audio without the multipath and noise of analog FM.

Many broadcasters have held off purchasing new transmitters during this period, taking a "wait-and-see" attitude while digital proponents develop their systems. Now, with the promise of DAB not yet realized, transmitter sales apparently are picking up once again.

With digital STLs, digital processors and digital inputs to digital exciters, it is possible to make the best of the current analog FM transmission system and provide listeners with the "next best thing" to DAB.

Some manufacturers say their current generation of FM transmitters is "digital ready." It seems that there is little risk of being locked out of DAB in purchasing a new analog transmitter today.

In many ways, today's FM broadcast transmitter, while still performing the same function, has come a long way from those big, noisy, hot monsters of FM's early days; it still generates and amplifies a modulated FM carrier.

What has changed most is the packaging, and that has improved tremendously. Manufacturers are listening to users, and they are ready to adapt their products to industry changes and customer needs. With the transmitters available today, broadcasters can provide their audiences with better sound than ever before.

Who knows? It may be so good that when a digital mode finally gets here, nobody will notice!

■■■■
Cris Alexander is director of engineering for Crawford Broadcasting in Dallas.

Litton

Life Support

Commercial Products

CHECK THIS OUT

Transmission Line Maintenance Made Easy

Litton's InstaGas™ nitrogen concentrators provide valuable protection to coaxial cable while pressurizing with clean, dry, high purity nitrogen.

HERE'S WHAT OUR CUSTOMERS ARE SAYING...

"Reliable source of high-purity gas withing minutes of start-up"

"Easily configured and compact for many applications"

"Eliminates safety hazards and hassles of transporting bottles"

"Dramatic cost of gas savings"

To learn about InstaGas™ products, including the turn-key systems installed on Mt. Wilson, California, call or write Litton Life Support, P.O. Box 4508, Davenport, Iowa 52808-4508 • (319) 383-6000 • (800) 553-1860 • FAX (319) 383-6125



SBE

Society of Broadcast Engineers
Sustaining Members

DataXpert™

CD-ROM based software offers immediate access to the latest broadcast information.

- Audience Data
Arbitron 12+ Audience Information
Population Within Contour
- Programming Data
Network, Format, Market
- Contact Information
Call Sign, Licensee, Address,
Contact (GM, SM, PD, CE),
Phone/Fax
- Technical Station Data
- Print Options
Contour Maps, Reports, Labels
- Monthly Updates



800-368-5754 e-mail: info@dataworld.com

► FM TRANSMISSION, continued from page 68

CONTINENTAL ELECTRONICS

The 802D 50 W digital FM exciter from Continental Electronics Corp. is based on a standard PC motherboard and has a fully open architecture which allows expandability, simplified maintenance and service, and familiar operating parameters.

The 802D's PC base controls all system operations, diagnostics, background functions and any user-defined tasks. The front LCD screen provides operational



information through a series of scroll-through screens. An adjacent soft-key control panel allows the user to monitor operating parameters, including RF power, audio and composite levels and SCA injection.

The 802D features floating point digital signal processing (DSP) technology, which operates precisely at any audio level. The chips perform signal processing, FM generation, interpolation, stereo generation, pre-emphasis, composite processing, audio processing and SCA generation and filtering. They can also accept other functions, such as software upgrades.

A new direct conversion board converts the digital output from the DSPs directly to the operating frequency without use of IF or heterodyne circuitry.

Equipped with two identical A/D converters, the standard 802D also has an optional stereo input circuit card that can be field- or factory- installed. Output power is digitally controlled at user-defined levels.

For more information, contact Steve A. Claterbaugh in Dallas at (214) 381-7161; fax (214) 381-3250 or circle Reader Service 22.

CROWN

Crown Broadcast, a division of Crown International, offers versatile solutions in FM broadcasting with a line of integrated products and power amplifiers. Major selling points are modularity, ease of service and value.

The line of integrated FM systems includes solid-state transmitters, exciters and translators, with power output from 1 to 500 W. Stereo generation, audio processing and RF are combined into one easy-to-ship unit. Units are frequency selectable, using internal dial switches.

Crown power amplifiers are distinguished by their efficiency and compact size. They provide output power of 1 to 2 kW.

Crown broadcast products carry a three-year warranty.

For information, contact Crown Broadcast at (800) 294-8050 or (219) 294-8050; send e-mail to broadcast@crow-intl.com; or circle Reader Service 100.

ENERGY-ONIX

Energy-Onix offers the ECO Series of grounded grid FM transmitters; 11 models are available. The series employs capacitance coupled plate blocker circuit instead of a Teflon blocker and utilizes a single tube to 30 kW and solid-state drivers for the entire series. The

control circuitry maintains the position of the circuitry without the use of electronic memory or computer chips.

Other features contained in the ECO series are VSWR foldback and protection and automatic power output control, which keeps the transmitter power output steady, even with 10 percent variations in line voltage.

The ECO models 2 through 10 have an internal harmonic filter, contain an independent solid-state IPA that doubles as an emergency transmitter and includes built-in line surge protection. ECO models 15 through 30 use an external harmonic filter, and contain a triode tube in PA and a zero bias Hi Mu triode power amplifier that requires no neutralization, a 100 W exciter and filament voltage regulator.

ECO models 40 and 50 use an external

harmonic filter, zero bias triode PA, single ended with two tubes in parallel, a 4 kW solid-state independent driver that doubles as an emergency transmitter, and an independent power supply for each final tube. They were designed for local and remote control.

For more information, contact Energy-Onix in New York at (518) 758-1690; fax: (518) 758-1476 or circle Reader Service 21.

HARRIS

Harris has expanded its Platinum Series of Z CD FM transmitters to include new 2 kW and 10 kW transmitters. The first Platinum Z CD transmitter (shown) is a 5 kW model. These transmitters combine Harris' solid-state technology and DIGIT CD digital FM exciter. The Z-plane

combining system delivers full power to the antenna even if a hot-pluggable power amplifier module is removed from the transmitter. Featuring Harris' DIGIT CD digital FM exciter, Platinum Z CD transmitters deliver 16-bit CD-quality audio. The exciter is available with either an analog input module or a digital input



See FM TRANSMISSION, page 71

DB's new FM Mos-Fet power amplifiers.



- COLD-FET™ technology:**
- ultra high efficiency
 - low power consumption
 - maximum redundancy
 - simplified set-up
 - proportional foldback protection system for uninterrupted service

MODELS:

KF 300:	300 W
KF 500:	500 W
KF 1000:	1000 W
KF 2000:	2000 W
KF 3000:	3000 W
KF 5000:	5000 W

DB

Eletronica Telecomunicazioni

Via Lisbona, 38 - Zona Industriale Sud - 35127 Padova - Italy - Tel. +39 - 49 - 8700588 (3 lines) - Fax +39 - 49 - 8700747 - Telex 431683 DBE I
Internet: <http://www.dbbroadcast.com> - E-mail: sales@dbbroadcast.com

Circle (95) On Reader Service Card

World Radio History

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

Remote Satellite Control!



List
\$299.00

DSC-20 Dual Satellite Controller

The DSC-20 adds remote control capability to the Scientific-Atlanta ENCORE, DSR-3610, AD-4595 and Virtex StarGuide II receivers, allowing channel/memory changing by automation systems or simple push buttons. The DSC-20 can be configured to control any two of the above mentioned receivers. Customized programming is accomplished with a non-dedicated computer.

- Two separate 20 contact closure remote ports
- 100 memory selections in PC mode (ENCORE)
- 20 memories for ENCORE in contact closure mode
- Unlimited 12-character printable ASCII serial strings in PC mode (StarGuide II)
- 20 network channels for StarGuide II in contact closure mode
- 2400/9600 baud RS-232 or RS-485 PC control/programming port (either locally or remotely via optional modem)
- Two 9600 baud RS-232 receiver serial ports
- Nonvolatile program memory plus a password/ID option

Check out our new web site for additional information and a list of distributors!

Voice 360 428 6099
Fax 360 428 6719

BROADCAST TOOLS inc.

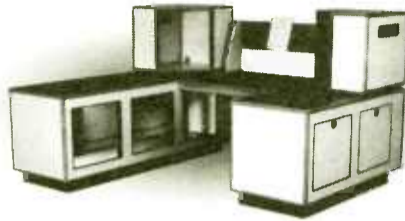
E-mail: bt@broadcasttools.com Internet: www.broadcasttools.com

READER SERVICE NO. 69



Advanced
Furniture
Systems

Introducing our AFS series Studio Furniture



ATTRACTIVE, VERSATILE AND VERY AFFORDABLE!

Our modular system allows us to create a furniture design to match your needs without paying custom furniture prices.

For complete details on furniture, studio accessories, pricing and quick delivery, visit our web site...www.omn.com/afs or call

Advanced Furniture Systems
970-663-4123

READER SERVICE NO. 66

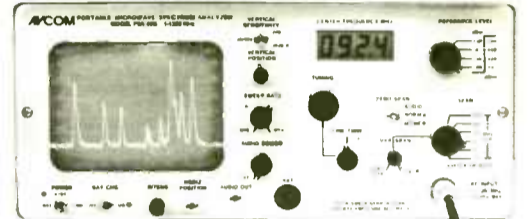
NEW EXPANDED COVERAGE

AVCOM'S PSA-65B Portable Spectrum Analyzer 1-1250 MHz In One Sweep!!

AVCOM's newest Portable Microwave Spectrum Analyzer, model PSA-65B, has an expanded frequency range from less than 1 MHz to 1250 MHz, for the amazing price of \$2930.

AVCOM's new PSA-65B is a low cost general purpose spectrum analyzer that's loaded with features and options. The PSA-65B covers frequencies thru 1250 MHz in one sweep with a sensitivity greater than -95 dBm at narrow spans. The PSA-65B is ideally suited for 2-way radio cellular, cable, satellite, LAN, surveillance, educational, production and R&D work. Options include new 1250 MHz frequency extenders, BNG-1000A tracking (noise) generator, audio demod for monitoring, log periodic antennas, carrying case (AVSAC), and more.

For more information, write, FAX, or phone.



AVCOM

500 SOUTHLAKE BOULEVARD
RICHMOND VIRGINIA
804-791-2500 FAX: 804-794-8284

Receive brochures ON-LINE via AVCOM's new AVFAX.
Call from your fax and be ready to receive. 804-379-0500

READER SERVICE NO. 68

Automatic Text to EAS-Code and Voice on any ENDEC. EAS? No..

EAYES

Dial 1-800-RATINGS Press Extension 200

Weather in the 3rd Dimension
from a Digital Weatherman



- Total Automation
- No Equipment Purchase

Dial 1-800-RATINGS Press Extension 100

Tom Churchill's
weatheradio™

P.O. Box 1400 • Dubuque Iowa 52004 • Fax (815) 747-2062 DIAL 1-800-RATINGS

READER SERVICE NO. 28

REMEMBER THE **CORTANA**
FOLDED **UNIPOLE ANTENNA?**
WE STILL MAKE IT WITH THE
SAME HIGH QUALITY MATERIALS
AND WORKMANSHIP.
IT FEATURES...

- **BROAD BANDWIDTH** for better sound,
- **GROUNDING ANTENNA** for lightning & static electricity,
- **ELIMINATES ISOCOUPERS** in VHF & UHF antenna lines,
- **BEST ANTENNA FOR DIRECTIONAL ARRAYS.**

Also

**DETUNING SYSTEMS FOR ANYTHING THAT DISTORTS YOUR
AM COVERAGE PATTERN: TOWERS, POWER LINES, TANKS
OR ANY METAL STRUCTURE.**

FOR INFORMATION CALL, FAX OR WRITE:

nott ltd.

4001 La Plata Hwy
Farmington, NM 87401
phone 505 327-5646 fax 505-325-1142

READER SERVICE NO. 67

WATTCHMAN® TRANSMITTER PROTECTION SYSTEMS



WATTCHMAN™ protects your transmitter and transmission line system. A permanent 19" rack installation used with any dual socket line section 7/8" through 6 1/8" and elements (additional) to monitor CW, TV, and FM power. Model 81070 features two easily read meters to monitor both forward and reflected power. Abnormal conditions quickly cause transmitter shut down.

TERMINATING LIQUID/AIR LOADS
(84000/85000 series) available to cover CW power ranges of up to 10,000 Watts over a frequency range of DC to 2.4 Ghz. All models are available with optional thermal overload switches to interface with the user's interlock or warning circuit.

NEW



COAXIAL DYNAMICS, INC.
15210 Industrial Parkway
Cleveland, Ohio 44135 (216) 267-2233
Toll Free 1 800 COAXIAL (262-9425)
FAX: (216) 267 3142
Web Site <http://www.coaxial.com>
Email: coaxial@apk.net

READER SERVICE NO. 27

Eimac Factory Rebuilds

Have your Eimac tube **REMANUFACTURED**
by the trusted original manufacturer.

- Eimac Quality
- Original Specifications
- Factory Testing
- New-Tube Warranty

CPI/Eimac Division
San Carlos, CA., USA
(800) 414-8823 or
fax (415) 592-9988

Available through
Richardson Electronics
1-800-348-5580

Replacement Sockets,
Collets and Repair Parts
Are Available from Stock



READER SERVICE NO. 29

The Right Radio Tools!

Lesser products limit your station's sound by their poor performance and RF susceptibility: rock solid Benchmark interfaces have performance way beyond the limits of 16-bit digital!



- The Audio World Interface™ - Recorder Interface/Line Amp
- The Junior Audio Director™ - Stereo Mode Controller
- The Junior Audio Director™ Plus - 8 Channel Mode Controller

The Audio World Interface™ is a two-way recorder interface that is switchable to a line amp or a mono mix amp. The balanced inputs and electronic transformer outputs both have front panel recessed gain controls. The rack mountable chassis includes LEDs to indicate signal overload, switch position, and power presence.

Use it to mate R-DAT and analog recorders, to generate Mono from Stereo, or as a balanced line amplifier to compensate for level mismatches. Superlative performance, versatile operation, and an incredibly low price, make choosing the Audio World Interface™ a no-brainer!

Benchmark
...the measure of excellence!™

<http://www.benchmarkmedia.com> Phone 800-262-4675 • 315-437-8119



BENCHMARK MEDIA SYSTEMS, INC.

READER SERVICE NO. 107

► **FM TRANSMISSION**, continued from page 69 module. The analog input module can be replaced with the digital input module in minutes, enabling broadcasters to upgrade easily to an all-digital air-chain when they are ready.

For more information, contact Daryl Buechting in Illinois at (217) 221-7405; visit website www.broadcast.harris.com or e-mail: hbd@harris.com or circle Reader Service 23.

KINTRONIC LABORATORIES

The Kintronic FM Isocoupler is a device used for isolating the FM feed line on an AM tower from ground so that the transmission line outer conductor may be grounded to the tower and also connected to the earth ground after leaving the tower.

This is accomplished by use of a double-tuned transformer having less than 150 µµfd capacitance between primary and secondary windings. The top coaxial line section and the housing hood are made to operate at the potential of the AM tower, and the main enclosure and lower coaxial line section will operate at earth ground potential.

The custom FM transmission patch bays are available in 7/8-inch EIA or 3-1/8-inch EIA. Used for AM, FM and TV applications, the patch bay features an interlock switch for each U-link position wired to a terminal strip and exclusive Teflon supports for U-link elbow center conductor to assure proper U-link-to-port alignment. The patch bays have an impedance of 50 ohms.

For more information, contact Kintronic Laboratories in Tennessee at (423) 878-3141; fax: (423) 878-4224 or circle Reader Service 26.

LARCAN-TTC INC.

The FMS Series of FM radio transmitters and translators from Larcan-TTC are 100 percent solid-state and produce digital quality performance. Because of the broadband design, FMS Series transmitters are frequency agile.

The transmitters are available in power ranges of 200 W to 1 kW; 200 W to 2 kW; 1 to 4 kW; and 2 to 8 kW.

The FMS Series produces direct FM modulation with a capability of ±500 Hz. The frequency range is programmable in 2.5 kHz steps, while the frequency stability is ±100 kHz.

For more information, contact Larcan-TTC Inc. in Colorado at (303) 665-8000; fax: (303) 673-9900 or circle Reader Service 60.

LPB

The FM ADvantage from LPB is a low-power FM stereo transmitter that will allow the user to broadcast stereo audio to an audience legally without PA systems, custom off-band systems and FCC licensing. The FM ADvantage can be set between 88 and 108 MHz. The 4-inch by 6-inch transmitter weighs only a few ounces.

The FM ADvantage is stereo- and mono-compatible, with user selection of the frequency anywhere in the standard FM broadcast band. It comes with FCC Type Certification and is in compliance with Part 15 of the FCC Rules.

In addition, each unit includes a permanent antenna and an AC power adapter.

For more information, contact LPB in Pennsylvania at (610) 644-1123; via e-mail: lpbsales@lpbinc.com; visit the website: www.lpbinc.com or circle Reader Service 61.

MILESTONE TECHNOLOGIES

Milestone Technologies Inc. introduces the new SATX Data Broadcasting File Transfer Software, a communications software program designed to transfer binary files over a data broadcasting network. Operating on IBM and compatible PCs, SATX can be used over any simplex (one-way) or broadcast channel, such as high-speed FM subcarriers, Direct Broadcast Satellites, RDS/RBDS and VBI, and is compatible with any hardware that utilizes a standard RS-232 serial port. SATX also can be used in two-way VSAT systems when operated in a

broadcast mode.

Other features of the SATX include data filtering, complete logging, two levels of error detection, adjustable baud rates, batch file capability and adjustable block sizes. SATX supports DOS, IBM OS/2.3X, Win 3.1, Win95 and Win NT operating systems. Customization is available, as well as general consulting for data broadcasting projects.

For more information, contact Milestone Technologies Inc. in North Carolina at (919) 856-0700; send e-mail to milestone7@compuserve.com or circle Reader Service 63.

NAUTEL

New from Nautel is the FM5 Transmitter, with a maximum 5.5 kW. It offers broadcasters the many benefits of



digital performance and solid-state reliability. With an overall efficiency of 70 percent — which Nautel says is the highest available for a 5 kW solid-state FM transmitter — the FM5 offers low power consumption. Nautel says this results in the lowest possible cost of ownership.

The FM5 Transmitter also features five RF power modules, each See FM TRANSMISSION, page 72 ►

More Powerful. More Efficient.

Nautel Solid State Modular AM & FM Transmitters



AM Power Module

12 kW & 60 kW AM

New Design Nautel 12 kW and 60 kW AM transmitters deliver power and modulation capability to spare. Energy costs are lower than ever with overall efficiency typically 85-88%.

Only Nautel offers complete duplication of exciters and on-air serviceability of modules to keep you broadcasting.

Nautel — Continuing 25 Years of Solid State Leadership.

10 kW & 20 kW FM

The Nautel FM10 offers 11 kW solid state FM power capability in a single cabinet. A 20 kW combined system is also available.

The highest AC to RF efficiency of any solid state FM transmitter means less waste energy and cool reliable operation.

The Nautel design keeps you on the air even with a module removed for service.



FM Power Module



NAUTEL's Website: www.nautel.com

Contact us for more information about our full range of AM and FM transmitters.

Nautical Electronic Laboratories Limited Hacketts Cove RR #1 Tantallon, Nova Scotia, Canada B0J 3J0 Phone: (902) 823-2233 Fax: (902) 823-3183
Nautel Maine Inc. 201 Target Industrial Circle Bangor, Maine 04401 U.S.A. Phone: (207) 947-8200 Fax: (207) 947-3693

► FM TRANSMISSION, continued from page 71 equipped with a ventilation fan and a simple control and status display. This feature includes an automatic VSWR foldback and an automatic AC restart with alarm memory.

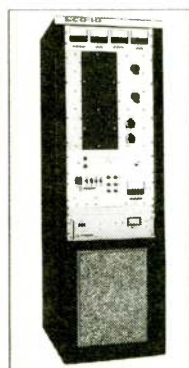
Also included with the FM5 is the NAUTEL NE50 digital FM exciter, which provides the necessary minimum input of 20 W to the IPA. The NE50 has 32-bit Direct Digital Synthesis technology, digitally constructing the carrier signal with a numerically-controlled oscillator.

For more information, contact Gary Manteuffel in Nova Scotia at (902) 823-2233; e-mail: nautel@fox.nstn.ca or circle Reader Service 62.

PTEK

Designed to maintain constant output power levels regardless of line and

Problem:



I need a new FM transmitter but prices are so high I may have to settle for a used one.

Solution:

The ECO Series!

Rugged, Feature Packed & Reliable the **ECO** series was built with you in mind.

We've kept the cost low - so low in fact the **ECO** series competes favorably with the total cost of a used transmitter.

ECO quality - unsurpassed!

Plus you will experience the benefit of lower operating cost with extra long tube life and lower power consumption.

The most **ECONOMICAL** new transmitter on the market is available in powers from 2KW to 50KW.

Over 150 **ECOs** are already in the field!

**Great Products
Great Solutions!**

"The Transmitter People"



BROADCAST EQUIPMENT CO., INC.

PO BOX 801 ♦ 1306 RIVER ST.

Valatie, NY 12184

Phone 518-758-1690

Fax 518-758-1476

energy-onix @ energy-onix.com

Circle (173) On Reader Service Card

drive fluctuations, PTEK amplifiers and exciters feature continuous high-performance operation.



The power level is adjusted from 25 percent to full-rated power through the front panel. Amplifiers and exciters employ self-degradation with increasing VSWR. The exciters are factory preset to the required frequency, but can be changed in the field through phase-locked loop frequency synthesis control from a high stability master oscillator.

Because of the low drive requirements, PTEK high-gain RF amplifiers are compatible with most exciters on the market. The amplifiers and exciters also feature large analog meters with multi-meter indications and full remote capabilities in rack-mountable chassis.

PTEK offers solid-state VRF power amplifiers from 150 W to 1 kW, and FM exciters from 10 to 50 W. The broadband solid-state power module found in each unit features a heat sink, cooled by forced air from a fan mounted behind the front panel.

For more information, contact Peter Forth in California at (408) 448-3342; fax: (408) 448-5951 or circle Reader Service 64.

QEI

The QEI Quantum Series FM transmitter is solid-state, resulting in

efficient and therefore moderate power consumption and reduced heat loads. Featuring modular power amplifiers, the series is available in power levels between 1.2 and 9.6 kW in 600 W increments, allowing the broadcaster to purchase precisely the amount needed.

Housed in a 23-inch-wide, 36-inch-deep cabinet, the Quantum series offers a small footprint, but also contains the exciter/driver, FET power amplifier modules, output combiner, power supplies and harmonic filter/directional coupler.

The Quantum 300E and 600E exciter/drivers specifically were designed for the needs of a high-power, solid-state transmitter. The power amplifier modules are comprised of four FETs combined for a total of 600 W of output power. Each module is fed by a self-aligning connector to a high-power combiner.

Filtered air positively pressurized the cabinet eliminating dust infiltration.

For more information, contact Jeff Detweiler in New Jersey at (800) 334-9154; fax: (609) 629-1751, via e-mail: qeisaless@qei-broadcast.com or circle Reader Service 104.



We Design Reliability

SWR products and services continue to surpass industry standards. We offer new systems as well as provide service and upgrades on existing ones. Stations all over the world depend on SWR technology to meet broadcasters' needs.

SWR designs Reliability into:

- UHF, VHF, and FM antennas
- Coaxial and waveguide transmission lines
- Combiners and Filters

All SWR products are supported with turn-key installations and 24 hour emergency service, focusing on service before, during, and after the sale.

For additional Domestic sales information call 1-800-279-3326



Our Priority is Your Satisfaction

Antennas and Transmission Line Systems
Systems With Reliability, Inc.
P.O. Box 856, Ebensburg, PA 15931
1-814-472-5436 FAX 1-814-472-5552
email: swr@third-wave.com
Website: http://homepage.third-wave.com/swrweb

Circle (212) On Reader Service Card
World Radio History

SUPERIOR BROADCAST PRODUCTS

Superior Broadcast Products offers single tube FM transmitters at 2.5 kW, 5 kW and 10 kW, each with a solid-state exciter and IPA amplifier. Model KAFM 2500 has an output power of 100 W to 2.5 kW, Model KAFM 5500 outputs 500 W to 5.5 kW; and Model KAFM 10000 has an output power of 1 to 10.5 kW. All three models have an output impedance of 50 ohms.

Model KAFM 2500 maintains a frequency stability of 700 Hz. The specifications list harmonics at -68 dB, mono input impedance at 600 ohms and stereo impedance at 10,000 ohms. The transmitter is cooled by forced air, and the operating temperature range is -15 degrees to +40 degrees Celsius.

Models KAFM 5500 and KAFM 10000 both maintain a frequency stability of 500 Hz. The harmonics are listed as -68 dB, mono input impedance is 600 ohms and stereo input impedance at 10,000 ohms. Both transmitters are cooled by forced air and the operating temperature range is -15 to +40 degrees Celsius.

For more information, contact Superior Broadcast in Texas at (800) 279-3326 or (972) 473-2577; fax (972) 347-2578 or circle Reader Service 65.

WARNER ELECTRIC

Warner Electric introduces the Stabiline WHR Series Automatic Voltage Regulators for radio broadcasting installations. The regulators automatically feed voltage-sensitive equipment a constant voltage level, even when the power line input and system load vary widely.



The Stabiline Voltage Regulators maintain an efficiency rate to ± 1 percent and feature a high overload capacity, power ratings from 2 to 1,680 kVA, a maintenance bypass switch, zig-zag neutral generation and analog or digital control. There are single or individual phase controls, single- or three-phase models, and 19-inch rack mount versions. The Stabiline Voltage Regulators work with all voltages up to 660 V.

For more information, contact Ted Gladis in Connecticut at (800) 787-3532 or (860) 585-4500; fax: (860) 582-3784, visit the website at www.warnernet.com/sev_main.html or circle Reader Service 99.

TUBES continued...



ISO 9001 Certified
The Reliable Manufacturer for
NEW POWER TUBES
Triodes
Tetrodes
Pentodes

NEW SOCKETS & REPLACEMENT PARTS
TUBE REBUILDING
Worldwide Availability
Made in U.S.A.

CALL 800-414-8823
Int'l (415) 592-1221
Fax (415) 592-9988

Visit our Web Site at
<http://www.eimac.com>



Circle (228) On Reader Service Card

RF POWER
The Best of Two Worlds!
Eimac
Immediate Shipment from Stock



Svetlana
Se Hable Español
(760) 744-0500 • (888) 744-3500
Fax: (760) 744-1943
e-mail: rfp@rfparts.com

RF PARTS
435 S.O. PACIFIC ST.
SAN MARCOS, CA 92069

Circle (227) On Reader Service Card

REBUILT ELECTRON TUBES
Partial List: **6623, 23791, TH150, 6425F, 6427, 8550, 6804, 6696, 6697, 5681, 5682, 5671, 7804, 3CX10,000H3, 3CX20,000H3, 4CX5000A, 4CX35,000C**

Worn out power tubes purchased

Vacuum Tube Industries, Inc.
1-800-528-5014
508-584-4500 X75

EIMAC, RCA, AMPEREX, 3-500, 3CX1500A7, 4-400, 4X150A, 4CX250B, 572B, 807, 833C. Westgate 800-213-4563.

TURNTABLES
Want to Sell

Russco TT (2) w/Micro-Trak arms, works & in gd cond, \$500. K Lewis, KJOK, 949 S Ave B, Yuma AZ 85364. 520-782-3544.

Technics SP-10 TT w/pwr supply, 2 tonearms w/o stylus, \$575/lot or \$295 ea; Kenwood 2055 TT, deteriorated drive belt. \$40. N Williams, KPPM, 1726 S Pebble Beach Ave, Tucson AZ 85710. 520-617-0579.

ECONCO
Quality Rebuilt Tubes
Approximately 1/2 the Cost of New

Call for Our Price List
800-532-6626
916-662-7553
FAX 916-666-7760

Circle (224) On Reader Service Card

FOR THE BEST PRICE
& 24 Hr service on transmitting tubes call Goodrich Ent Inc at **402-493-1886** day or night, FAX **402-493-6821**.

TRANSCOM CORP.
Serving the Broadcast Industry Since 1978

Fine Used AM & FM Transmitters and Also New Equipment
For the best deals on Celwave products, Andrew cable and Shively antennas.

100 W FM 1985 Harris FM100K	5 KW AM 1979 Harris MW-5A
2.5 KW FM 1988 Continental 814-R	5 KW AM 1980 Harris MW-5A
10 KW FM 1986 ITA 10,000B	5 KW AM 1982 Continental 315F
20 KW FM 1977 RCA BTF 20E1	5 KW AM 1982 Continental 315R-1
20 KW FM 1973 Collins 831G	50 KW AM 1978 Continental 317C-1
20 KW FM 1972 CCA FM20,000DS	50 KW AM 1981 Continental 317C-1
20 KW FM 1978 Harris FM20K	50 KW AM 1981 Harris MW-50B
25 KW FM 1982 Harris FM25K	50 KW AM 1982 Harris MW-50B

1077 Rydal Road #101, Rydal PA 19046
800-441-8454 • 215-884-0888 • FAX No. 215-884-0738

VISIT OUR INTERNET SITE: WWW.TRCORP.COM
SEND YOUR E-MAIL REQUESTS TO TRANSCOM@TRCORP.COM

Circle (226) On Reader Service Card

TRANSMITTERS

TRANSMITTERS

Want to Sell
QEI Quantum 2.4 kW solid state w/built in 300 W exciter, 2 yrs old, BO; BE FM1C 1 kW solid state, 4 yrs old, BO. D Magnum, WBOG, 1021 N Superior Ave, Tomah WI 54660. 608-372-9600.

RCA BTF-20E 1975 20 kW FM tuned to 103.9, no exciter, some spare parts & tube, working when removed from service, you ship, \$16,500. T Fussell, Springer Bldg, 1240 E Villa Maria, Bryan TX 77805. 409-776-1240.

BROADCAST EQUIPMENT
USED: FM/AM Transmitters, RPU's, STL's, FM Antennas, Consoles, Processing, etc. CONTINENTAL COMMUNICATIONS. 3300 Chippewa, St. Louis MO 63118. 1-800-664-4497 FAX: 314-664-9427.

RF oscillator for McMartin AM xmtr #554024, \$100. P Deen, WAJQ, 912-632-1000.

TA-100 FCC type approved AM low pwr microbdctg xmtrs (2), freq adjustable, 100 mW pwr, approx 5 mi range, sell together or separate, \$1200 ea/BO. D Neatgur, Radio Omega, 230 N 5th St #910, Reading PA 19601. 610-371-8866.

TRANSMITTERS
www.amfamtv.com
800-678-4762

CCA FM-5000 5 kW FM on 100.5 & easily retuned, manual, no exciter, \$15000; Collins 830 10 W FM hybrid exciter w/manual, \$250; Versa-Count 322 10W FM freq agile exciter w/manual, \$350; Tepco J-316 translator w/built in exciter for audio insertion, needs work w/manual, \$1000. D Jackson, WQQQ, 19 Boas Ln, Wilton CT 06897. 203-762-9425.

Gates BC-1H 1 kW new tubes, spares, clean, capacitors for upper AM band or low, \$2000. F Cresce, KC4MOP, Oxon Mill MD. 301-567-2012 (eves) or facmop@erols.com

Gates BC1-H, spare tubes, tuned to 850 kHz, \$2000. W Love, WKBZ, Muskegon MI 49441. 616-798-2141.

Gates BC-1T AM xmtr, tuned to 1600 kHz, needs tubes, \$1200, u-pick up. L Bornacelli, WCGO, Chicago IL. 708-755-5900.

Harris MW1, gd cond. G McLintock, WNQM, 1300 WWCR Ave, Nashville TN 37218. 615-255-1300.

Jones J-316 translator, \$400. B Williamson, Digital Radio Eng, Middletown NY 10940. 914-386-4001.

McMartin 1 kW AM, exceptionally clean, 17 yrs old, avail 11/1/97, \$3000. Dave, KTGO, Box 457, Tioga ND 58852. 701-664-3322.

New Bext LEX 25 programable FM exciter/transmitter, 87.6 108 MHz range, \$1000. 202-806-3623.

QEI 675 FM EXCITERS, \$1550; QEI 675T600 FM AMPLIFIERS, \$3550, units are reconditioned and tuned on your frequency. Purchase includes manual and 6 month warranty. Contact Bob Brown at (609) 232-1625.

Used McMartin BF-5M 5 kW-FM tuned and tested on your freq, completely refurbished; Also 3.5 kW & 25 kW. Goodrich Ent. Inc., 402-493-1886.

Want to Buy
McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

INCREDIBLE TRANSMITTERS



TV TRANSMITTERS	FM RADIO TRANSMITTERS Including Stereo Encoder
1Watt \$1,114	1Watt \$1,138
2Watt \$1,664	30Watt \$1,499
4 Watt \$2,138	300Watt \$3,174
20 Watt \$3,880	600Watt \$5,960
40 Watt \$5,046	1KWatt \$8,716
100 Watt \$6,206	2KWatt \$11,905
200 Watt \$9,874	4KWatt \$20,741
400 Watt \$13,171	
800Watt \$18,295	
1KWatt \$22,900	
2KWatt \$38,900	

TAYLOR
The Transmitter People
Taylor Bros. (Oldham) Limited, Lee St. Oldham England. Tel: 0161 652 3221, Fax: 0161 626 1736


WHEN YOU'VE GOT SOMETHING THIS GOOD, YOU CAN'T HELP BUT BLOW YOUR OWN HORN!



There comes a time when a company knows it has a break through product. And for Energy-Onix, that time is now.

The **ECO 15-30**, Single tube, High Power Grounded Grid Transmitters up to 32 KW.

- ◆ Solid State driver up to 2 KW serves as emergency transmitter
- ◆ Straight Forward field proven control system
- ◆ VSWR Protection & More
- ◆ BEST OF ALL THEY ARE ECONOMICALLY PRICED!



Energy-Onix
"The Transmitter People"
1306 River St, Valatie NY 12184
518-758-1690
FAX: 518-758-1476

Circle (225) On Reader Service Card

Technics SP-15 TT platter, BO. J Hodges, WITC, Cazenovia College, Cazenovia NY 13035. 315-655-8283 ext 178/136.

Technics SP-10 bdot TTs (2) w/pwr supplies; Technics home unit TT w/built-in toner & cartridge, BO. Skip, WUFM, POB 8470, Westerville OH 43086. 614-890-9977 ext 307.

Advertise! Call your advertising representative 703-998-7600 for details & deadlines

SERVICES

Tower Sales & Erection Turnkey Site Development Installation & Maintenance AM/FM Broadcast, TV Microwave Systems, Antennas & Towers TOWERCOMM Communications Specialists Ben Wall President 6017 Triangle Dr. Raleigh, NC 27613 (919)781-3496

FM Frequency Searches \$250 APPLICATIONS AND ALLOCATIONS Call Michael Celenza (516) 681-0878

DON'T GAMBLE WITH YOUR ADVERTISING DOLLARS! Advertise in Radio World and reach 18,000+ broadcast professionals. Call Simone TODAY! 703-998-7600



For more information, contact Simone Mullins at 703-998-7600

HELP WANTED

CHIEF ENGINEER: Act fast, this could be your last chance! Wants to hire in October. 5 Stations, FM & AM, experience in all areas, studio (including computers and hard drives), transmitter, STL and digital. Send resume to: General Manager, East Carolina Radio, Inc., POB 1418, Nags Head NC 27959.

MAINTENANCE TECHNICIAN: ABC Radio Network: We require 5+ years of experience in repair and maintenance of analog and digital audio equipment, telephone, and RF systems. Must be able to troubleshoot to the component level. Computer and network experience required. Design and construction experience preferred. Please send resume and salary requirements to: Employee Relations Dept. SS, ABC, Inc, 77 West 66th Street, New York, NY 10023. EOE/M/F/D/V.

NEWS ANCHOR AND REPORTER: WMTR, New Jersey's leading AM station, is looking for an experienced broadcast journalist to join our fast paced award winning news department. The successful candidate must have at least three years of commercial radio experience in both anchoring and reporting, and must have a voice and style compatible with the Adult Standards format. The ability to work independently on tight deadlines is a must. The position requires excellent writing and news gathering skills. AFTRA membership will be required. Please send your tape, writing samples and resume to Sandra Jones, News Director, WMTR Radio, 55 Horsehill Road, Cedar Knolls, NJ 07927. No calls please! EOE.

ORBAN CUSTOMER SERVICE ENGINEER Orban is looking for a broadcast engineer to provide technical support to our customers on our line of broadcasting equipment. This support includes providing information on specifications, applications, installation and setup, troubleshooting and repair, and theory of operation. Must have an AA in electronics or equivalent experience, and at least 4 years of broadcast engineering experience. Experience with IBM-compatible PC hardware is also essential. You must have excellent verbal and written communication skills, and thorough knowledge of electronic troubleshooting and repair techniques. Send resume to: Orban, Human Resources, 1525 Alvarado Street, San Leandro, CA 94577.

CHIEF ENGINEER For a large Los Angeles audio production facility. Must have extensive experience in studio maintenance, digital work station operation and maintenance, as well as computer network skills. Position requires experience in designing and building new studios and familiarity with all building support systems i.e. air, power, etc. Strong people skills and work ethic a must. Full benefits, moving costs and a very competitive salary discussed upon formal inquiry. Send resume to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box #97-10-15-1RW.

CHIEF OPERATOR/ENGINEER WANTED Opportunity to be part of an engineering team responsible for a multi-station group in the northeast. Must be experienced with high power FM, directional AM, computers, and remotes. Should be a team player, willing to work on-call hours as part of this full time position. Minimum 5 yrs experience desired. Reply to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box #97-10-15-2RW.

ENGINEERING OPPORTUNITIES! Triathlon Broadcasting is looking for experienced chief engineers with excellent digital skills and the desire to manage complex automated technical operations in aggressive duopoly environments. There is an immediate opening in Washington state and others possible as we expand. Successful applicants will have at least 5 yrs. radio engineering experience with at least 2 yrs. as a chief and good references. FAX resume to 520-204-2221.

POSITIONS WANTED Bdotg school graduate seeks position in Jacksonville FL area to showcase personable on-air & creative copy-writing talents, pure focused ambition. Jenifer, 904-880-3246.

BEE EMPLOYMENT

Daily local weather for your coverage area, accurate, dependable, avail by tape, fax, zipped Fed Ex, low rates. Chris, 606-293-2341 or e-mail: wx1534@aol.com

Recent bdotg school grad w/medium market exper seeking FT position, creative prod & solid air skills, will relocate. Ryan, 405-340-0405.

30 yr pro seeks small market mgmt opportunity in SE. Broad knowledge, creative, organized, high integrity. Potential, POB 14706, Greenville SC 29610.

CE waiting to make FM station worries go away, you have a steak I'll make it sizzle, love clean powerhouse audio, music, penetrating RF. 1-904-467-3122 or mychucky@funport.net

Five yrs news exper, covered local, state, national, can do sports, prefer Kansas City or St Louis metro area. 816-633-7356.

Graduate willing to travel for on-air position or other. Emily 405-745-2286.

Knowledgeable R&B DJ seeking work. Comedy

sketches, reviews on movies & sports, commentary on current events, etc. G Foster, 1-800-414-4348.

Morning A/T-M/D, phones, fun, mouth & brains work together, call Mike at 517-362-7251.

News anchor/producer, prod voice talent, AT for adult standards, reasonably priced, many yrs exper, gd pipes, creative. Alex, 513-777-8423.

Voice Overs/Top 30 mkt voice for your custom liners/opens/promos. 25 yrs radio/tv, call Jay for demo, 615-384-4121.

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

Table with 4 columns: Page No., Advertiser, Reader Service No., Page No., Advertiser, Reader Service No. Lists various companies and their corresponding page numbers.

Production Director: Lisa Stafford, Ad Traffic Assistant: Anastacia Stornetta, Production Manager: Lisa Hoagland, Desktop Management: James Cornett, Publication Manager: Lori Pikkaart, Ad Coordination Manager: Simone Mullins, Classified Coordinator: Lori Pikkaart, Circulation Director: Sheryl Unangst, Showcase Coordinator: Vicky Baron, Circulation Manager: Robert Green, Ad Traffic Manager: Kathy Jackson, Accounts Receivable: Steve Berto

Advertising Sales Representatives U.S. East: Skip Tash 703-998-7600 ext 160 Fax: 703-998-2966 U.S. West: Dale Tucker 916-721-3410 Fax: 916-729-0810 U.S. Midwest: Sandra Harvey-Coleman 765-966-0669 Fax: 765-966-3289 Other Regions: Stevan B. Dana 703-998-7600 Fax: +1-703-998-2966 Latin America: Alan Carter +1-703-998-7600 ext 111 Fax: +1-703-998-2966 UK, Ireland: Phil Guy +44(0)1869-337508 Fax: +44(0)1869-337509 Europe, Africa, Middle East: Raffaella Calabrese +39-2-7030-0310 Fax: +39-2-7030-0211 Asia/Pacific: Eiji Yoshikawa +81-3-3327-2688 Fax: +81-3-3327-3010

Free Subscriptions are available upon request to professional broadcasting and audiovisual equipment users. For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review; send to the attention of the appropriate editor.

FROM THE LARGEST FACILITY
TO
THE SMALLEST STATION
PEOPLE KNOW
THE
AUDITRONICS 210 SERIES



PEOPLE KNOW:

- ◆ classic style when they see it
- ◆ sturdy reliability when they feel it
- ◆ convenience when they operate it
- ◆ support when they need it
- ◆ affordability when they buy it
- ◆ longevity when they use it year after year
- ◆ thousands are in use right now

AND PEOPLE GET THE BEST AUDIO FROM:

AUDITRONICS

3750 Old Getwell Road, Memphis, TN 38118 (901)362-1350 Fax: (901)362-8629

GSA #GS-03F-4032B

Sometimes
we have to
settle for
what we
need...

Wouldn't
you rather
Get what
you
WANT?

We've taken the very **best** technology, components and field engineering input to make this the **FINEST** console available.

The **A-6000** is engineered specifically for major market stations that demand a lot of function and need to lead with technical excellence. It's based on an open architecture mainframe that lets you change module locations with **no** restrictions, giving layout top priority and allowing easy reconfiguration as format needs change.

The **Wheatstone A-6000** has the appearance, features and power to excite the most demanding program and production staff; its engineering, performance and thoughtful design will help your personnel achieve broadcasting excellence.

 Wheatstone

315-452-5000

Circle (57) On Reader Service Card