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**Market Watch Visits  
 The Twin Cities**

Radio in Minneapolis/St. Paul:  
 We're more than just weather.

**See Page 27**

**Transition to Digital**

When the NFL went to Mexico,  
 Midcom put ISDN to work.

**See Page 17**

**Radio World**

The Newspaper for Radio Managers and Engineers



January 20, 1999

**INSIDE**

**NEWS**

▼ Religious  
 broadcasters  
 convene in  
 Nashville.  
**See Page 6**



▼ USA Digital Radio has formally  
 asked the FCC to approve IBOC  
 DAB as the new digital broadcast-  
 ing standard in this country. RW  
 prints excerpts of the filing.

**See Page 10**

**ENGINEERING**

▼ RW checks out Whirlwind's  
 portable PressMite.

**See Page 19**

**GM JOURNAL**

▼ CBS station KNX(AM) in L.A.  
 has had the same format and same  
 GM for three decades, and occupied  
 the same building for 60 years.

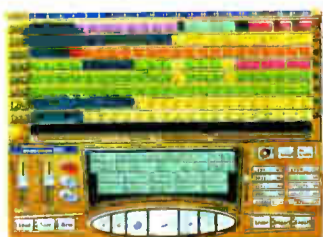
**See Page 27**

▼ A preview of next month's RAB  
 convention in Atlanta.

**See Page 30**

**STUDIO SESSIONS**

▼ Mel Lambert on digital data  
 compression; reviews of the Hip  
 Hop eJay and Valley Audio 401  
 Microphone Processor; and more  
 tape-baking tips.



Visit RW Online at  
[www.rwonline.com](http://www.rwonline.com)

**Canada Set for National DAB**

by James Careless

**TORONTO** For Canadian radio broad-  
 casters, 1999 may be the year their digi-  
 tal radio dreams start coming true. Private  
 and public broadcasters in Toronto, Van-  
 couver and Montreal are ready to roll out  
 digital audio broadcast-  
 ing service to some 35 percent of the  
 Canadian population during the coming  
 months.

During 1999, some 10 million poten-  
 tial listeners will be able to tune into  
 Eureka-147 DAB broadcasts in the L-  
 band, said Duff Roman, president of the

The Toronto  
 DABug



nonprofit industry consortium Digital  
 Radio Research Inc., which has been  
 leading Canadian DAB efforts.

With so many potential listeners,  
 Roman said, Canada is achieving the criti-  
 cal mass that receiver manufacturers need in  
 order to bring receivers in quantity to  
 Canada.

However, at press time it was not  
 known whether DAB would roll out in



all three loca-  
 tions simulta-  
 neously or on  
 a market-by-  
 market basis.

From a pure-  
 ly transmission standpoint, Toronto is  
 ready. Nineteen AM and FM stations have  
 been simulcasting their analog signals  
 from the CN Tower since November 1998.

**Toronto feeds**

To do so, the feeds from the stations  
 have been bundled into four groups of  
 five, and each of the groups are broadcast  
 from one of four Itelco 800 W DAB  
 transmitters.

**See DAB, page 14**

**Top Radio Groups  
 Invest in USADR**

by Leslie Stimson

**COLUMBIA, Md.** Many of the  
 country's largest radio groups are  
 investing in USA Digital Radio to sup-  
 port the development of in-band, on-  
 channel DAB technology.

With this announcement, the tech-  
 nology company has met one of its  
 important goals: to win public support  
 for its efforts from other broadcast  
 owners.

USADR announced in January that  
 12 groups, including nine of the top 10,

have taken equity positions in the pri-  
 vately held company.

President Robert Struble said the  
 investment totaled "tens of millions of  
 dollars" and signaled nationwide sta-  
 tion support for the viability of the new  
 technology.

USADR also hopes the announce-  
 ment will help convince receiver manu-  
 facturers of the viability of IBOC DAB.  
 The announcement was timed with the  
 beginning of the Consumer Electronics  
 Shows in Las Vegas.

**See USADR, page 3**

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# ◆ NEWSWATCH ◆

## New CEO for UPI

**WASHINGTON** Arnaud de Borchgrave is the new president and chief executive officer of UPI. He was to assume his new duties Jan. 4.

De Borchgrave was a senior editor for Newsweek for 25 years, and former editor-in-chief for The Washington Times newspaper. He comes to UPI from the non-profit Center for Strategic & International Studies.

"Consumers of news are turned off by an overdose of superficial coverage of a world increasingly hard to compre-

hend," de Borchgrave stated. "I look forward to the challenge of repositioning a global news service for the 21st century at the forefront of the knowledge revolution."

He replaces James Adams, who resigned in August (RW, Dec. 23, 1998).

## Emmis Pulls Strong 3rd Q

**INDIANAPOLIS** Emmis Communications had a strong third quarter.

Total broadcast cash flow was just above \$28 million, a 65-percent increase over the same quarter a year ago, while third-quarter radio revenues rose 13 percent over the same period. Emmis Chairman and Chief Executive Officer Jeff Smulyan stated, "Our radio, international and publishing divisions have proven once again that well-managed assets can perform in any competitive or economic environment."

Also, Chief Financial Officer Howard Schrott planned to step down at the close of the company's fiscal year Feb. 28. Schrott will continue to serve as a consultant for Emmis.

## New Emmis Digs

**INDIANAPOLIS** Emmis Communications unveiled new digs — a new seven-story, 142,000-square-foot headquarters. The new Emmis Plaza will house 10 Emmis entities: five radio stations, Indianapolis Monthly Magazine, Emmis Publishing, Network Indiana and AgriAmerica radio networks and Emmis corporate offices.

See NEWSWATCH, page 3 ►

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## Take a LOOK at THIS:



## Then look at our competition.

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# CCA Electronics Files Chapter 11

by Randy Stine  
and Leslie Stimson

**FAIRBURN, Ga.** A bankruptcy court in Georgia could decide the fate of CCA Electronics Inc. by the end of March.

The radio transmitter maker has filed for bankruptcy under Chapter 11 of the United States Bankruptcy Code, allowing CCA to remain in business while it attempts to reorganize.

CCA owner Ron Baker said CCA would continue to service customers and honor warranties throughout the bankruptcy proceedings.

"We are not ceasing operations. This reorganization actually began almost a year ago. We filed for protection to enable us to carry the plan through," Baker said.

In court papers filed on Oct. 26, 1998 in Georgia, company officials estimated company assets to be worth just over \$1.1 million. Outstanding liabilities totaled nearly \$2.5 million.

"My clients have every intention of filing a reorganization plan in early 1999 and staying open," said CCA attorney Frank Scroggins.

CCA had 120 days from the filing (Oct. 26) to file a reorganization plan. A bankruptcy judge would then determine whether to allow the plan to go forward, or to order a liquidation.

U.S. Department of Justice Attorney Leroy Culton said, "Everyone comes in filing Chapter 11 thinking they can pull it off and remain in business. However, from my experiences, less than half of them will avoid liquidation."

Scroggins said the search for a new equity partner continues. "We don't have anyone waiting in the wings right now, but a new infusion of cash is always an option. For the time being, CCA must remain focused on servicing current customers and delivering transmitters already contracted for."

Scroggins said Baker, also the company president, had been ill and away from the business for much of 1998, which led to financial difficulty.

One hundred and fifty five unsecured creditors were listed in CCA's filing. Radio World is one of the unsecured creditors. Summit National is listed as the principle lender and only secured creditor. According to the filing, CCA

owes Summit \$326,000.

When a company files for bankruptcy, a secured creditor holds a security agreement.

In CCA's case, Summit Bank holds all equipment, machinery, accounts receivable, inventory and Baker's home and life insurance policies as collateral for the loans. An unsecured creditor holds nothing as collateral.

Summit National Bank Vice President Ling Chiang said Summit National "is attempting to cooperate with CCA's plans to reorganize operations and remain in business."

Chapter 11 allows a business to remain in operation under the direction of a federally appointed bankruptcy trustee. As a company looks for new capital, the trustee works with creditors in an effort to establish a reasonable repayment plan. A Chapter 7 filing, by contrast, calls for immediate liquidation of company assets in order to satisfy creditors.

"We know this is painful for all involved," Scroggins said. "This type of thing is a last resort. The good news is that CCA is salvageable. We are working closely with the primary lender to do what is in the best interest of not only CCA, but the creditors as well."

Culton said a committee of unsecured creditors has been appointed by the United States Trustee. The committee had yet to meet as of press time.

Scroggins said that the unsecured creditors committee, of which RW is a part, had been inactive to this point. "Sometimes you'll have these committees take a very active role, and sometimes not. In this case, so far they haven't."

## Examining claims

CCA attorneys and creditors met Dec. 3, 1998, in Atlanta. The meeting was the first to include the federal trustee, in this case, DOJ attorneys.

"It was a chance for the trustee to examine Mr. Baker, CCA and the creditors' claims. It was a very preliminary first step in the whole process," Scroggins said.

CCA Electronics was founded in 1963 by a group of RCA transmitter engineers, after RCA announced it was ending its transmitter program. Baker bought the company when it was bankrupt in 1982 and built it back up.

Over the years, CCA's line of AM, FM and shortwave transmitters earned a reputation as affordable and dependable.

One industry salesperson said, "They are almost transmitter kits. They have a simple, old tube design that has proven very reliable."

The same observer said owners

should not worry if CCA eventually fails. "Everything in those transmitters can be bought through most broadcast suppliers. Any station with a capable engineer should be confident that they won't be left out in the cold."

When the business was doing well, CCA had as many as 50 employees working at its Fairburn headquarters just outside of Atlanta. Scroggins said the company now has fewer than a dozen employees.

## Groups Put Millions Into USA Digital Radio

► USADR, continued from page 1

USADR was established in 1991 as a partnership by CBS, Westinghouse Electric and Gannett. The new owners include Chancellor Media, Citadel Communications, Clear Channel Communications, Cox Radio, Cumulus Media, Emmis Communications, Entercom Communications, Hefel Broadcasting, Jacor Communications, Radio One and Sinclair Broadcast Group. Joining them is Chase Capital Partners, a media investment firm.

CBS Corp. President and Chief Executive Officer Mel Karmazin said, "The broadcasters who have joined CBS as owners of USADR will now take part in one of the most significant events in the history of radio, the transition to a digital future."

USADR said its owners now have a

combined total of more than 1,600 stations with combined revenues of approximately \$5.4 billion annually, according to BIA Research.

BT Alex Brown Inc. was the placement agent for the offering. The amount invested by each group varies and was not revealed. Struble said no one group is a majority shareholder.

Changing from a partnership to a corporation means USADR will create a board of directors. Struble hoped that would happen by February. The makeup had yet to be determined.

The change also means more top executives from the various investors will take part in major decisions affecting the future of the company. Previously, Karmazin enjoyed that privilege.

► NEWSWATCH, continued from page 2

## Chancellor Closes Whiteco

Chancellor Media Corp.'s \$930 million purchase of Whiteco Outdoor has closed. This deal, plus Chancellor's purchase of Martin Media, L.P. in the third quarter, makes Chancellor Outdoor Group the fifth largest such group, owning more than 36,000 outdoor advertising display faces.

Chancellor President and CEO Jeffrey Marcus said Whiteco's outdoor management team will take over prominent roles with the combined organizations. Marcus said, "Formed in the last five months, the Chancellor Outdoor Group now has a broad

national reach and will be a key growth catalyst for our company."

If all announced deals close as announced, Chancellor Media Corp. will own more than 465 stations.

## Calling All Stations

**WASHINGTON** The FCC's long-awaited Internet system for station call signs is due to begin early this year. Under the system on the FCC's Web site, station personnel will be able to see quickly if a specific call sign is available, or change an existing call. The FCC planned to announce how it will handle the transition and when the new system becomes effective.

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# Radio in Our Larger World

A new version of the book "Communication Technology Update" helps put radio in the context of mass media and other communication systems.

The book strives to be a single source of information on developments in mass media, computers, consumer electronics, satellites and telephone issues. This edition adds print, electronic mail and personal communication technologies.

As August Grant notes in his introduction, communication technologies are the nervous system of contemporary society. He argues that no single technology can be understood without comprehending competing and complimentary technologies and the larger social environment.

Still, this is a broad palette for 336 pages, and so the discussion for each set is brief.

The section on radio broadcasting is eight pages and was written by David Sedman, an assistant communications professor at Southern Methodist University. Among his sources were trade publications, including **RW**.

So how do Sedman and his colleagues assess radio and its broader environment?

## Visionaries

"While technological developments in the radio industry today are mundane, acting primarily to enhance the current AM-FM system," Sedman wrote, "visionaries are reaching out to create a radio system with a more dynamic sound, greater reach, and a sweeping range of new features."

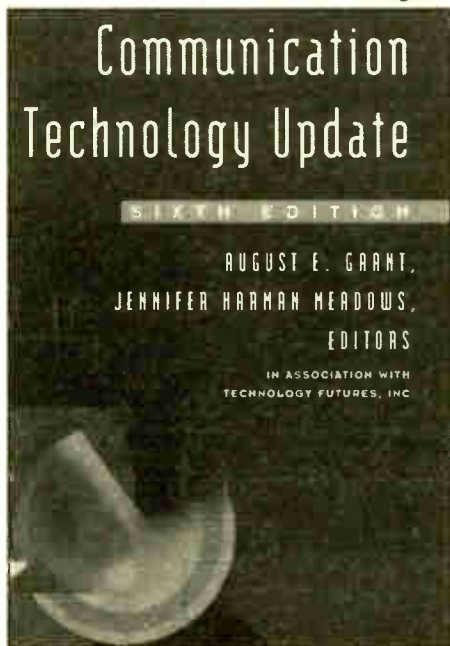
He cites several attempts to improve the service. He acknowledges that change comes hard to radio. A new service generally requires approval by a governing body: acceptance by broadcasters; consent from the electronics industry; and adoption by the public.

"These factors, however, have not stopped engineers from continuing to design technology to improve upon radio's quality and scope," he states. Among those changes are digital exciters, the expanded AM band and RDS. Not all, he acknowledges, will be successful. He also discusses new delivery modes, most notably the Net and DAB.

I find it interesting to read how academics and other observers view our business. The danger, of course, is drawing simplistic conclusions. But their comments can tell us a lot about ourselves.

For instance, Joan Van Tassel writes this about how computers have affected radio:

"Automated stations operate with almost no human intervention at all, except a part-time engineer who makes sure the systems keep running. A computer draws down a syndicated signal, stores it, inserts local spots, and plays it out, reprocessing the signal to make it conform to the station's FCC-assigned



channel. A salesperson works outside the station, an accounting service handles the business administration, and an owner writes and cashes the checks."

Does that depict your daily life?

Elsewhere, John Roussell writes: "In the near future, portable digital radio will be commonplace. The ability to send digital audio along with other information will transform listening into more of a multi-media experience. Listeners can receive a playlist display, updated sports scores or weather information — all while enjoying their favorite station."

Maybe. But as Al Peterson, our own

technical editor, is fond of saying, radio should not get too far from its fundamental job to provide compelling programming.

I wish the book went into more depth on radio. It could explore ownership trends, changing patterns of programming, questions of ownership diversity and who should have access to the spectrum.

Still, it's a handy reference. Readers familiar with radio will find it useful in its overview of other fields. What are the most popular consumer audio formats? How will cable address the opportunities of high-speed modems? Will cable become a major player in telephony? How do MMDS and LMDS work? Where does digital TV stand? What are the differences among digital subscriber line services like ADSL, HDSL and IDSL? What can we expect from the satellite communications industry, 3-D audio, distance learning, PCS, pagers, palmtops, DVD-ROM? What is our "broad-band future"?

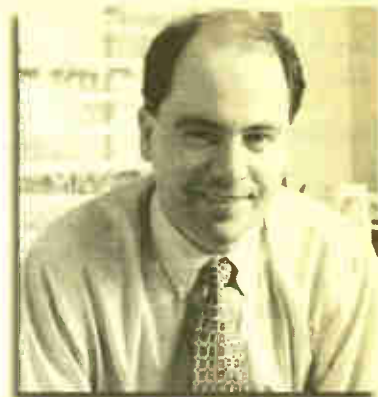
Certain trends are clear: Digital is affecting every communication industry. The Telecom Act of 1996 has had sweeping impact in mass media. And the Net shows no signs of slowing up.

In reading this book, I conclude that despite its environment, radio is in a strong position. According to the U.S. Bureau of the Census, 98 million households have radios, a penetration of 99 percent. Our medium has unprecedented reach and power. But are we using it wisely?

The "principle of relative constancy" cited in the book suggests consumers spend a limited amount of income on mass media, and the amount rarely increases when new media arise. The authors invite us to consider which media are likely to be the winners. I wonder: Is radio, with its homogenizing programming, in a position to win the fight?

"Communication Technology Update, Sixth Edition" is edited by August Grant and Jennifer Harman Meadows in association with Technology Futures Inc. The book is published by Focal Press. Retail price is \$35. To order, call (800) 366-2665 or e-mail to [custserv@bh.com](mailto:custserv@bh.com)

## From the Editor



**Paul J. McLane**

★★★

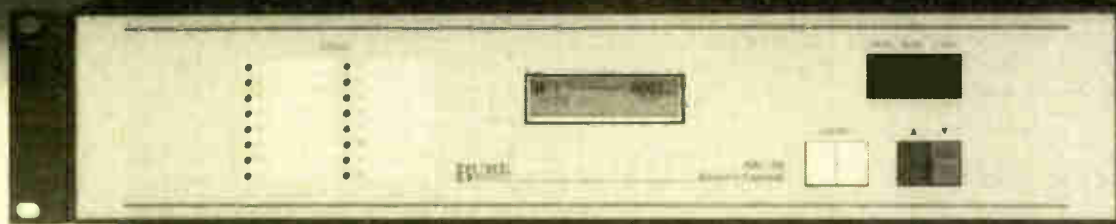
This is the last issue in which the name Robert "Skip" Tash will appear in the staff box on the facing page. After seven years of service as sales manager and associate publisher, Skip is leaving **RW** to take part in a radio-related business venture. Readers and clients know Skip for his dedication to the industry, his constant presence at trade shows and his diligence on behalf of his customers. We in the office also know him for his great sense of humor, his unfortunate golf slice and his unrivaled paging announcements over the office phone system.

Skip has been an important force in the growth of **RW**. We wish him all the best.



Skip Tash

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## ◆ READERS FORUM ◆

Letters received are the property of RW, and may be edited for space considerations.

**Legal, licensed low-power**

Dear RW,

As a career broadcaster and RW reader, I appreciate the power of radio. As a new Santa Monica, Calif. city councilmember, I want to use this technology to serve our city.

All it will take is switching on a low-power radio transmitter and opening the microphone to the events and the people of Santa Monica. Our community will instantaneously be better-informed and connected. A local micro-radio station will become an indispensable community institution, making government more accessible. I believe this is a worthy application of low-power FM, one which the radio industry should welcome as being truly in the public interest.

On Dec. 8, 1998, just in time to send an official resolution to the FCC's hearing on proposed rulemaking, our city council affirmed unanimously that "the city of Santa

Monica supports and encourages the legal licensing of local low-power community radio stations."

I call on other municipalities to join us in moving toward true local implementation of radio's potential for public service.

Kevin McKeown  
City Councilmember  
Santa Monica, Calif.

**Kudos**

Dear RW,

Lynn Meadows and RW are to be commended for doing a well-researched and thoughtful article on the growing pains of EAS ("EAS Still Battles Alert Flubs," Nov. 25, 1998). The field of journalism should note this excellent example of how a controversial story should be handled.

One slight correction/expansion is in order. The "E Chip" concept must certainly not be limited to monitoring only one source of warnings, lest we fall back into the trap

**Radio World**

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Next Issue of Radio World  
February 3, 1999

**So, Who's Your Shadow?**

On Feb. 2, almost every radio morning host will do some kind of shtick about that little woodchuck in Pennsylvania that did, or did not, see his shadow.

You can take part in Groundhog Day in a much more productive way. "Groundhog Job Shadow Day" is an initiative to engage students in the world of work. Its organizers hope that half a million students will get a close look

at how skills they learn in school are put into action. They will shadow a workplace mentor as he or she goes through a normal day on the job.

This is a joint effort of several organizations including America's Promise: The Alliance for Youth, led by retired Gen. Colin Powell; the National School-to-Work Office; Junior Achievement; and the American Society of Association Executives. The first Shadow Day was in 1998.

Organizers say the day excites students to learn, introduces them to the requirements of professions, builds partnerships between schools and businesses, and encourages relationships between young people and caring adults.

Actor Kevin Sorbo, star of the TV series "Hercules: The Legendary Journeys," has agreed to promote the initiative. It's fitting that among his promotional plans is a radio tour.

The Society of Broadcast Engineers has endorsed the concept and encourages its members to have a student shadow them. This is consistent with the SBE's youth membership push, and we commend SBE for it. Leaders of other broadcast associations should consider this example for next year. Radio can benefit from new people and fresh ideas.

Local Junior Achievement offices are helping with student placement. For information, contact your local Junior Achievement office, call (410) 810-7910 or visit [www.jobshadow.org](http://www.jobshadow.org)

— RW

**Write to Us**

RADIO WORLD  
READERS FORUM

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Falls Church, VA 22041

[radioworld@imaspub.com](mailto:radioworld@imaspub.com)

we found ourselves in with EBS. Engineering solutions that set us up for single-point failure are not good solutions.

The "E Chip" must be married to a simple scanner. What should it scan? How about the VHF weather band and the AM band at minimum? I would not be opposed to seeing an "E Chip" in an all-band scanner.

We can add the Internet and other sources when we design and build the

**Revisiting radio ownership**

The following is an open letter to FCC Chairman William Kennard:

Dear Chairman Kennard,

I want to encourage you in your discussions about revising radio ownership regulations. When the Chancellor purchase of six Cleveland stations is approved, WCLV(FM) will be the only locally owned commercial FM station licensed to Cleveland.

WCLV has been a classical music station since 1962, and has become an important and vital institution in northeast Ohio. We had our opportunities to sell WCLV and walk away multi-millionaires. But we knew, that just like Philadelphia and Detroit, the classical format would disappear from the airwaves. Also, we aren't ready to retire from this business that we love so much and to which we have devoted our entire careers.

WCLV is probably in the best position of any Cleveland station to remain viable and independent, but we do see some effects which we suspect are from consolidation. Our national advertising business is drying up. Going into the '90s, it represent-

emergency lane on the information superhighway. The goal: accurate and timely 24/7 life-safety warnings for everybody.

Scan the AM band? Why not, as long as you can limit your scan to your local LPI station and whatever format locally is closest to an "all news" station.

Richard A. Rudman  
Los Angeles County EAS LECC Chair,  
California EAS SECC Southern Region  
Vice Chair, FCC EAS National Advisory  
Committee Appointee  
Los Angeles

**EAS aches and errors**

Dear RW,

It's been almost two years since broadcasters were forced to replace aging EBS

ed 25 percent of our total billing. This year, it will be under 5 percent. We have no concrete evidence that this is because of consolidation, but it is the only variable. It is common sense that the major companies have the power to suck up the business at the agencies before independents such as WCLV even get a chance to bid on it.

You are well-aware of the dangers that lie ahead with the radio industry controlled by a scant number of major companies — the lack of diversity, the death of localism, the removal of millions of dollars from local economies, and immense political power in just a few hands. Be aware also that there are those of us out here who believe that broadcasting should not be reduced to the level of a field of soy beans and must not only serve the stock holders but the community as well.

I have no objections to a company owning as many stations nationally as it has the will and resources, but I do think that in order to preserve localism and diversity that the number of stations a given company can own in a major market should be restricted to a maximum of four:

Robert Conrad  
President  
WCLV(FM)  
Cleveland

equipment with new EAS gear. EAS was supposed to make things a lot easier. Far from it. In the past, we received an RMT that included a spot for a dry-cleaner in Jackson, Miss. It was originated by the state primary, automatically relayed by the LPI and by stations that monitored the LPI.

Earlier this month, we received and relayed a RMT which had been originated by the LPI. The test contained no text announcement, as required by the rules.

Recently, the NWS in Jackson issued tornado watches. However, they coded them as warnings. As such, they were broadcast immediately. Later, when they attempted to send a severe thunderstorm warning for my county, they coded it as a RWT test instead. They aborted the test after it had commenced, and failed to send an EOM.

It took over a year before we ever received any alerts from the LP2 we monitor. They were sending the test at about 30 percent modulation, which my unit wouldn't decode (the rules call for 85 percent modulation). Our constant complaining finally got them to increase the modulation.

We still can't get any tests or warnings from the local NWS transmitter. Usually it's just a dead carrier. Instead I had to put up an outdoor antenna so I could monitor a NWS transmitter from another location.

I've complained to the FCC, the NWS and to the State Emergency Management Agency, but no one seems to care. I'll do my part to make EAS work, but if nobody else is doing their part, the system is worthless.

It's time somebody filed a petition for rulemaking to repeal Part 11 of the FCC's rules.

Larry Fuss  
President and General Manager  
Delta Radio Inc.  
Cleveland and Greenville, Miss.

**Correction**

An article in the Nov. 25, 1998, issue incorrectly stated that Lucent Digital Radio is using the AAC compression algorithm. LDR is using the Lucent-patented PAC algorithm.

# NRB Show: A Focus on Faith

Sharon Rae

Broadcasters who attend the annual National Religious Broadcasters show will leave with more than a head full of radio and a heart full of faith — they will also take home a commitment to carry the message of Christ.

"One of the new things we'll be launching at this conference is a spiritual project," said Karl Stoll, NRB director of communications. "We'll be talking to our membership about the need to bring a

and Expo. The Opryland Hotel is the backdrop for the 56th annual gathering, which features workshops, speakers, an exhibit hall and entertainment.

Mike Glenn, vice president of NRB, is predicting record attendance.

"We're excited about the location," he said. "This is our second time at Opryland. Tennessee is one of our stronger membership states."

NRB '99 carries the theme "Bridging the Centuries." Stoll said the theme represents not just the end of a millennium,

issues for us," he said. "I've seen so much information on the coming of digital radio. One of the key elements in our business is programming. We want to be good at what we do, but it is the message that is the bottom line for our membership. Lots of things have to do with media strategy. Being current with FCC rules and regulations. Knowing that our programming serves our audience. All these topics will be covered in workshops."

## Y2K and radio

The Y2K dilemma is on the minds of broadcasters. A Y2K management workshop will focus on radio station-specific concerns. Speakers include Larry Burkett, president, Christian Financial Concepts and Bob Allen of GSF & Associates.

Other sessions included in the NRB '99 educational tracks include an FCC



Charles W. Colson

update, a survey methods meeting, a program called "We've Got News — Informational Programming That Attracts & Maintains Your Audience" and another titled "New Technologies: A Help or Hindrance?" moderated by Mike Middleton, vice president of operations, Criswell Communications in Dallas. This

See NRB, page 7 ▶



The Cascades Garden at Opryland

spiritual revival to this nation and the world. We need our members to fast and pray and make a one-year commitment — not just a personal commitment to seek God, but also a commitment to take that message home to their communities."

## Around the world

More than 4,500 Christian radio and television broadcasters from around the world are set to converge on Nashville Jan. 30 to Feb. 2 for the NRB Convention

but the beginning of some incredible technological advances in the industry.

"This is such an exciting time for broadcasters," he said. "We want to be on the cutting edge technologically and as interest increases in religious programming."

Glenn noted important trends in the religious broadcasting industry, many of which will be covered in the 40 workshops at the show.

"Digital broadcasting, the Internet and broadcasting around the world are all hot

## On the Floor

The National Religious Broadcasters 56th Annual Convention and Exposition is expected to attract more than 200 exhibitors. Here is a sampling. The full list is available at [www.nrb.org/exhibit.htm](http://www.nrb.org/exhibit.htm)

- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| Acrodyne Industries, Inc.             | JDI Travel                           |
| ADC Telecommunications, Inc.          | Kintronic Labs                       |
| All American Network                  | Lanier Worldwide                     |
| American Family Radio Network         | LeSea Broadcasting                   |
| Andrews Tower                         | Liberty Counsel                      |
| Armstrong Transmitter                 | Media Ministries of the              |
| Audio Broadcast Group                 | Assemblies of God                    |
| AudioCentral.com                      | Mission America / Celebrate          |
| BEXT, Inc.                            | Jesus 2000                           |
| Bibles for the World                  | Moody Press                          |
| BibleSoft                             | MSE Media Solutions                  |
| Broadcast Electronics                 | National Digital Television Center   |
| Broadcasters General Store            | National Right to Life Committee     |
| Campus Crusade for Christ Intl.       | Network Duplication Services /       |
| Capital Dynamics                      | div. CBS Cable                       |
| CBSI/Custom Business Systems          | Network Music, Inc.                  |
| Central Tower                         | New Leaf Press/Master Book           |
| CDR Communications                    | NSN Network Services                 |
| Chosen People Ministries              | Oxford Ministries International      |
| Christ for the Nations                | OMB America                          |
| Christian Blind Mission International | Pacific Research & Engineering       |
| Christian Hit Radio Satellite Network | Prime Time Christian Broadcasting    |
| Christian Internet Television & Radio | Propagation Systems Inc.             |
| Network                               | RealNetworks Inc.                    |
| Christian Lists & Data Services Corp. | RFS Broadcast                        |
| Christian Network, Inc., The          | Salvation Army, The                  |
| Circuit Research Labs                 | Samaritan's Purse                    |
| Computer Concepts                     | Scala                                |
| Comrex                                | Shively Labs                         |
| Crouse-Kimzey                         | Spoken Word of God, Inc.             |
| Crown International                   | Strang Communications                |
| Dalet Digital Media Systems           | Superior Broadcast Products          |
| Data Check Corporation                | SWR                                  |
| Energy-Onix                           | TCI / BR Technology for              |
| ERI - Electronics Research, Inc.      | Communications Intl.                 |
| Family Life Communications, Inc.      | Tele-Data Services, Inc.             |
| Family Research Council               | Three Angels Broadcasting Network    |
| FamilyNet                             | Toronto Airport Christian Fellowship |
| Fellowship of European Broadcasters   | Total Living Network                 |
| Fidelipac                             | Trans World Radio                    |
| Gospel Media Network                  | UPI                                  |
| Gospel Music Association              | U.S. Mail & Marketing Corp.          |
| Habitat for Humanity                  | USA Radio Network                    |
| Harris Corp., Broadcast Division      | Washington Times National Weekly     |
| InfoCision Management Corp.           | Edition                              |
| Information Radio Network             | Westar Media Group                   |
| InterVarsity Press                    | World Evangelical Fellowship         |
| InService America                     | World Harvest Radio International    |
| INSP - The Inspirational Network      | World Wide Christian Radio           |
| Israel Ministry of Tourism            | Zephyrus Electronics                 |

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**BEXT**

► NRB, continued from page 6  
workshop is expected to help the non-engineer understand existing and emerging technology so he or she can make informed technical operation decisions. Topics include the direction of digital satellite technology and an overview of digital audio technology and equipment.

The Radio Advertising Bureau's "Radio Sales Boot Camp" is expected to draw much attention, because religious broadcasters have a different audience and different clients to attract than do



Michael Glenn

non-religious broadcasters.

"The audience that listens to Christian or religious radio is a bit of a different audience than if you did a core study of the average American family," said Roger Dodson, senior vice president for

**The number  
of religious radio  
stations went up  
by 28 last year.  
Kentucky added 13.**

training at RAB. "It is very family-based. It is also the kind of format where you focus on a long time spent listening. In religious families, they listen longer and listen more loyally."

Dodson said TSL and other listening habits must be taken into consideration when evaluating the types of commercials to be aired on religious stations.

#### Selling sophistication

"It's most effective when the commercial is targeted toward family-oriented activities. Specifically entertainment, books they read, movies they see, vacations they take, as well as products they buy. Therefore, qualitative as opposed to quantitative research is more important."

Dodson will present the "Radio Sales Boot Camp" at NRB.

"In the last few years, religious broadcasters have become more focused on attracting mainstream advertisers," he

said. "Consequently they have improved their sophistication level in the selling and marketing process to the community as a whole."

The session "Non-Commercial Radio Boot Camp: Building Stewardship Strategies for the Next Millennium" is to be moderated by Todd Isberner, president of ShareMedia in Shakopee, Minn. Speakers include Pat McLaughlin and Randy Sampson of the Timothy Group, based in Grand Rapids, Mich. Session breakouts include a biblical perspective on fund raising along with a question-and-answer forum on the current method of fund raising. Other focuses include acquiring a working knowledge of the "mindset and make-up of the next generation of givers."

Although the convention features

See NRB, page 8 ►

## NRB Convention & Exposition

**What:** The 56th Annual National Religious Broadcasters Convention & Exposition

**When:** Jan. 30 to Feb. 2

**Where:** Opryland Hotel Convention Center, Nashville, Tenn.

**How to register:** By fax (703) 330-7100, via the Internet at [www.nrb.org/conv.htm](http://www.nrb.org/conv.htm), by mail to 7839 Ashton Ave., Manassas, VA 20109, or on site in the Presidential Lobby of the convention center.

**Theme:** Bridging the Centuries

**Expected Attendance:** 4,500

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# NRB Increases Membership Numbers

► NRB, continued from page 7  
both radio and television interests, according to Stoll, there is more of a focus on radio.

"That's due to our membership," he said. Radio accounts for roughly 70 percent of NRB membership.

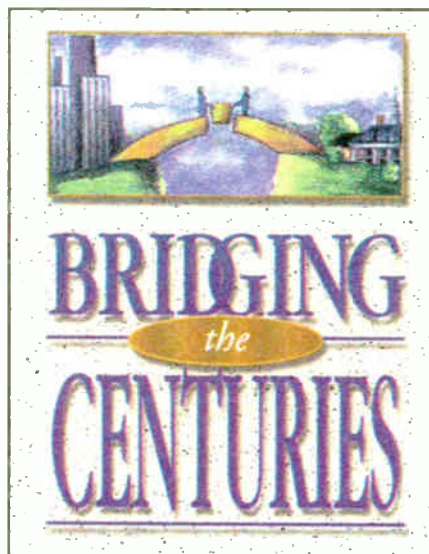
According to the NRB Directory of Religious Media, 1998 marked an increase in religious radio stations, with 28 more stations broadcasting religious programming in 1998 — an increase from 1,588 stations in 1997 to 1,616 stations in 1998. 1998 also marked the largest number of religious FM stations (829). The largest increase in radio sta-

tions was in Kentucky, which added 13 stations.

## Watergate under the bridge

Speakers slated at the convention include Chuck Colson, the former Nixon aide who turned a prison sentence into a ministry. Colson will deliver the keynote address at the anniversary banquet on Feb. 2.

"We're pleased to have him with us," said Stoll. "The timing with the presidential impeachment proceedings ... here's a man (Colson) who went from being one of the Watergate conspirators to having a serious life transformation as a result."



'Bridging the Centuries' is the theme of NRB '99

Colson founded Prison Fellowship Ministries soon after his release from prison in 1975. The Reston, Va.-based organization is an outreach effort assisting prisoners, ex-prisoners, victims and affected families.

Other speakers at the four-day convention include former U.N. Ambassador Alan Keyes and Bishop T.D. Jakes.

"Jakes is one of our major speakers," said Glenn. "He has a ministry in Dallas and is becoming quite well-known. He has had huge crusades."

Three-time Grammy winner Steven Curtis Chapman will perform at the anniversary banquet. Chapman's performance along with keynote speaker Colson will draw the convention to a close.

Some 220 exhibitors will feature their goods on the floor at NRB '99. Harris Corp. Broadcast Division is

among several radio-focused companies to display. "We will be showing a full line of broadcast solutions for today's radio broadcaster," said Jim Hauptstueck, Harris digital product manager. "We have been at the NRB show many, many times. It's a great show for us. These are good quality customers interested in efficient solutions."

Kim Winking, marketing services manager for Broadcast Electronics, agreed that the NRB is a worthwhile show for exhibitors. "We've always had



T.D. Jakes

good traffic and the show has generated good leads for us."

Stoll predicted a great show thanks in part to the increasing popularity of Christian programming. "There's a spiritual hunger in this nation," he said. "We're seeing growth not only in religious broadcasting, but in other areas as well. For example, spiritual book sales have grown. People are searching for the meaning of life and looking to God for the answer."

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The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks.



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### DIGITAL NEWS

#### Energy-Onix Wins DAB Money

**ALBANY, N. Y.** The state of New York thinks DAB is a great idea — because it will save energy.

A state energy research and development authority has awarded a \$187,500 contract to supplier Energy-Onix to develop a digital FM radio broadcast transmitter.

In its announcement, the energy authority hailed DAB as a power saver.

"Currently, broadcasters use very high-powered analog transmitters that consume between 10 and 40 kW of electricity," the announcement stated. "Once fully converted, digital equipment power consumption would be about one-tenth that." The authority said some 400 stations in New York alone would benefit, and estimated the energy savings to each station at \$9,600 to \$38,500.

President Bernie Wise said Energy-Onix is working with CBS to develop new DAB technology and field modifications for existing equipment, to reduce the cost of implementing DAB and make for a speedier transition.



CBS is the prime sponsor of USA Digital Radio, one of the three in-band, on-channel DAB research companies.

Energy-Onix expects that a DAB system for the United States would allow it to double its staff of 25.

— Paul J. McLane

#### Apollo Invests \$135M In CD Radio

**NEW YORK** Apollo Management L.P. completed its purchase of \$135 million of newly issued preferred stock in CD Radio, an FCC licenseholder to provide satellite-delivered digital audio broadcasting services. The previously announced deal has received majority stockholder and antitrust approval, according to CD Radio.

The company is building studios in New York City's Rockefeller Center. Mark Kalman has joined the company as vice president, national broadcast studio. Kalman was vice president of engineering and new technology for SW Networks.

CD Radio plans to offer 100 channels of pay radio in early 2000.

— Leslie Stimson



# ONE LOVES TO TRAVEL, THE OTHER PREFERS TO STAY HOME



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# Excerpts of the USADR Petition

In October, USA Digital Radio asked the FCC to seek public comment on its petition to implement digital AM and FM broadcasting in the United States. The following are excerpts from its Petition for Rule Making. More will appear in our next issue.

As **RW** went to press, the deadline for comments on RM-9395 had passed but reply comments were to be due Jan. 25.

The full text is available online at [www.fcc.gov/mmb/](http://www.fcc.gov/mmb/) or can be downloaded from [www.fcc.gov/Bureaus/Mass\\_Media/Filings/rm9395.pdf](http://www.fcc.gov/Bureaus/Mass_Media/Filings/rm9395.pdf)

Footnotes with source references and other details are omitted here but are available in the online version.

In the Matter of Amendment of Part 73 to the Commission's Rules to Permit the Introduction of Digital Audio Broadcasting in the AM and FM Broadcast Services

USA Digital Radio Partners, L.P., by its attorneys, hereby submits this Petition for Rulemaking requesting that the Commission initiate a rulemaking proceeding to amend Part 73 of the Commission's Rules to permit the introduction of digital AM and FM radio broadcasting. This Petition asks the Commission to adopt the rules set forth in Appendix A, the procedures outlined below for establishing a digital audio broadcasting ("DAB") system in the United States, and the policies articulated herein. Specifically, USADR seeks modification of the Commission's Rules to permit existing licensees in the AM and FM Radio Broadcast Services to upgrade their analog broadcasts to digital using in-band, on-channel ("IBOC") DAB technology. IBOC allows the simultaneous broadcast of analog and digital signals in the broadcaster's existing channel allotment in a manner consistent with the Commission's existing signal interference rules. Based on the important public benefits to be derived from the introduction of DAB, USADR requests that the Commission expedite its treatment of this Petition.

## I. INTRODUCTION

This rulemaking gives the Commission a

unique opportunity to dramatically improve an existing and vital communications service. IBOC DAB will provide the public with enhanced audio quality for both AM and FM radio, increased reliability and new auxiliary services without new spectrum allocations, disruptions in service to the public, or a drain on the Commission's administrative resources. In the past two decades, consumer demand for new and improved services has prompted a conversion from analog to digital in most other communications services. For radio broadcasting, which represents the oldest form of communications technology, a number of decades have passed since the last major innovation — the introduction of FM stereo in 1961. Now, recent advances in digital technology make it possible for broadcast radio to make the transition to digital using IBOC DAB.

In the last several years, the Commission has seen a dramatic increase in consumer demand

of the satellite-based Digital Audio Radio Service ("DARS"), which has the potential to offer improved sound quality to the public on a subscription basis. Until now, however, there has been no rational path for satisfying public demand for upgraded AM and FM broadcasting. As USADR demonstrates herein, advances in IBOC technology now provide a solution which will permit AM and FM listeners to enjoy enhanced sound quality, reliability, and service offerings from DAB.

## A. The Current Radio Broadcast Industry

Broadcast radio plays a critical role in everyday life, both in the United States and abroad. In fact, radio's role is so pervasive that it is largely taken for granted. It is the primary source of information and entertainment for vast numbers of Americans, providing music, news, weather, traffic and local information in thousands of communities across the country. Furthermore,

Although radio continues to be a strong medium, there is consumer demand for improved service and enhanced audio quality. Unfortunately, limitations inherent in today's analog broadcasting restrict options for improving AM and FM performance. These limitations have had a greater impact on AM than FM. On average, across all Arbitron markets, AM stations capture only 18% of local commercial share. Because AM is not able to provide high-quality sound, AM has become extremely dependent on news, talk and sports programming. Although many AM stations are extremely successful, other AM stations have been frustrated in their ability to meet listener requirements. . . .

Changes in listener expectations have been fueled, in part, by improvements in prerecorded music and new digital broadcast services. Digital CDs and tapes offer superior audio quality when compared to analog AM and FM radio. Listeners now have the option to obtain cable or broadcast satellite delivery of music to their home, to download music from the Internet and, in a few years, may be able to receive high quality digital audio from satellite DARS.

IBOC DAB provides a means to preserve the special role broadcast radio plays in American life by allowing radio to meet the higher sound quality the public demands. Because radio is local and provides vital information and entertainment at no cost to large numbers of people, its role in society cannot be overstated. Yet, to the extent radio remains analog, the FCC will miss an opportunity to authorize enhanced services which better meet public needs. DAB can upgrade existing radio, lay the foundation for the introduction of new digital services and, at the same time, help preserve radio's role in American life.

## B. Overview of IBOC Technology

IBOC technology provides a means for introducing DAB without the need for new spectrum allocations for the digital signal. There are many forms that an IBOC system might take. The USADR system is designed as an integrated AM and FM IBOC system which provides a comprehensive and flexible transition to an "all-digital" world. USADR has optimized its system to upgrade analog broadcasting by providing greatly enhanced sound fidelity, improved signal robustness and expanded auxiliary services, which are essentially an upgrade to existing subcarrier services. Although the USADR system is able to achieve the greatest enhancements in its all-digital mode, USADR has used IBOC technology to create a hybrid mode which will allow each AM and FM station to simultaneously broadcast the same programming in analog and digital. By allowing simultaneous broadcasting of analog and digital for all radio programming, this hybrid mode permits a rational transition to an all-digital environment without the need for additional frequency allocations to accommodate the digital signal.

The USADR IBOC DAB system consists of digital signals broadcast in the frequency assigned to an existing AM or FM radio station ("in-band"). Because the digital signal is placed with the emissions "mask" established for analog broadcasts ("on-channel"), it can be transmitted simultaneously with the existing analog signal (the "host" signal). Because IBOC DAB simultaneously supports both analog and digital broadcasting in the hybrid mode, it permits a rational transition to digital.

In the hybrid mode, the digital signal is broadcast at somewhat reduced power levels from those used in the all-digital mode in order to accommodate the analog broadcast. Nonetheless, the improved sound quality, reliability and coverage of both the analog and digital signals in the hybrid mode will immediately provide the listening public with greatly enhanced service. Moreover, the hybrid mode will support new auxiliary services which will upgrade existing subcarrier services. These auxiliary services will

See FILING, page 12 ►

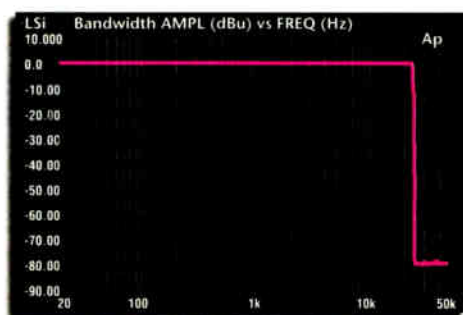
## USADR proposes that the commission adopt separate AM and FM composite analog/digital emissions masks for hybrid IBOC DAB.

for digital products. Consumers have enthusiastically embraced compact discs and are upgrading to digital mobile phones. The conversion to digital in many industries is transforming services offered to the public, and the impact of these new services is evident in many facets of everyday life. Pagers and mobile phones have become relatively ubiquitous and now offer numerous features based on new digital networks. Digital upgrades to wireline telephone networks are facilitating the introduction of services unknown only a few years ago. Digital television holds the promise of vastly improved video images and new ancillary services for the public. The Commission recently authorized the introduction

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GUEST COMMENTARY

# REACT Helps Broadcasters

Bob Leef

Most radio stations depend on several standard sources of traffic information — listener call-ins by telephone and cell-phones, their own airborne reporter or mobile cruiser, computer incident listings, and scanner listening. In Southern California there something more.

Members of REACT — Radio Emergency Associated Communications Teams — have a UHF FM repeater system to talk directly to traffic broadcasters. As they travel the freeways and encounter important incidents, they use their hand-held two-way radios to give first-hand reports while driving past the scene.

One location receiving this information is on KFI(AM) and KOST(FM) in Los Angeles, where REACT member Mark Denis does the traffic reports. According to Mark, he appreciates the absolute accuracy, timeliness and ability of field units to describe the situation in very few words quickly.

Mark believes a REACT member's

**Many members now are on GMRS, providing public service communications to an even larger audience.**

credibility is superior.

"If a REACTer calls in a tip, I feel I can broadcast the information as if I am looking right at it," he said.

He said REACT continues to be a vital source in helping the traffic broadcast community do its job better, and in turn serve the motoring public.

AirWatch is an information provider to 50 stations in Southern California. REACTer traffic reports also come in via the repeater, which is on the GMRS frequency of 462.675 MHz and covers a wide area. The General Mobile Radio Service (GMRS) allows this type of communications whereas it is difficult if not impossible for licensed amateurs to do the same on their frequencies due to FCC regulations.

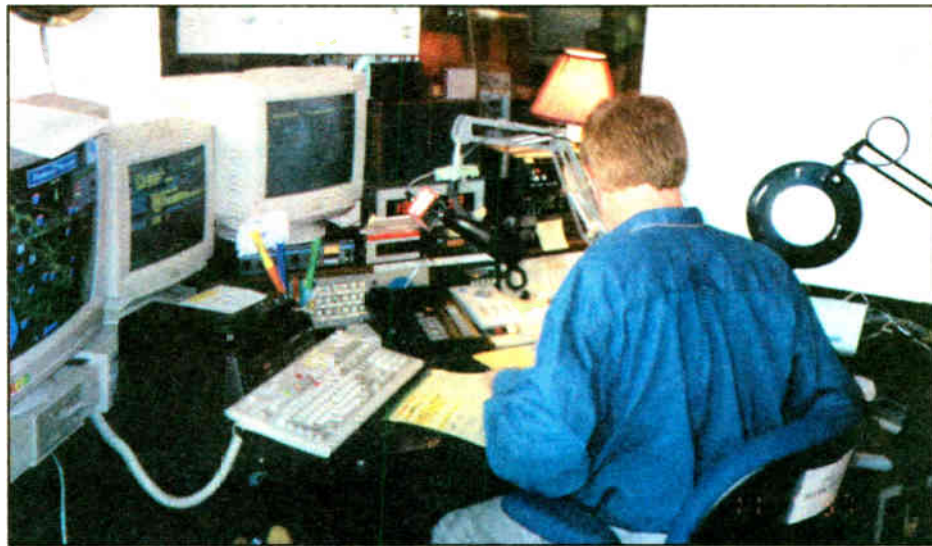
REACT was formed in 1962 in

Chicago, and at first used CB channel 9 to assist motorists equipped with that kind of two-way radio. Now, many members throughout the country are on GMRS because of its superior performance, providing public service communications to an even larger audience through broadcasters.

The organization, which has received the President's Volunteer Action Award, is headquartered at Suitland, Md. Information is available at (301) 316-2900, in Southern California at (800) 99REACT or on the Web at [www.reactintl.org](http://www.reactintl.org)



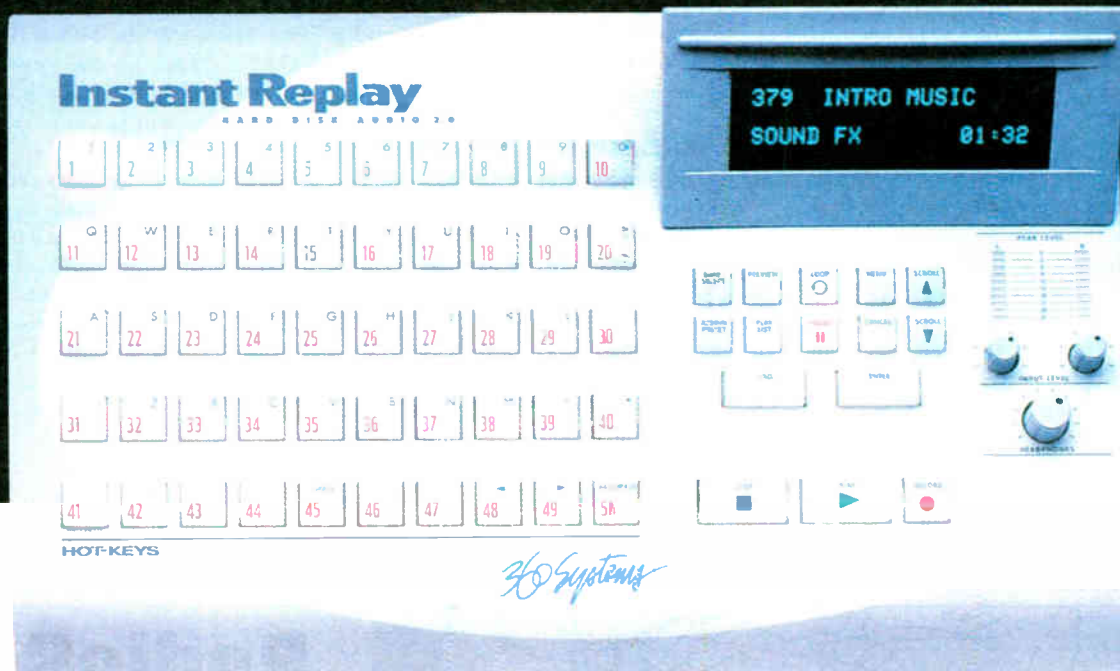
Bob Leef is with Crest REACT. He lives in Corona, CA.



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# Excerpts of the USADR Petition

► FILING, continued from page 10

be expanded in the all-digital mode of operations.

Developing IBOC requires a number of technical tradeoffs to ensure a system that optimizes benefits to the public. The audio quality, coverage and robustness must all be considered in system development. Without proper tradeoffs, an IBOC system will be excessively disruptive to the broadcast environment. However, if optimized, the radio industry and public will benefit from an IBOC system without new frequency allocations, without changes in the public's ability to find a favorite radio station on the dial, without requiring an immediate upgrade of all radio receivers and without disruption in service to the public.

## C. Requested Rulemaking

In this Petition, USADR proposes that the Commission adopt the following policies and specific amendments to Part 73 of the Commission's Rules that are necessary to manage the transition from analog to digital broadcasting.

First, USADR demonstrates in this Petition for Rulemaking the significant advantages of IBOC and IBOC's technical viability. It therefore urges the Commission to immediately make a finding that the public interest will be served by the introduction of digital radio and that IBOC will be the method for introducing DAB in the United States.

Second, USADR believes that a government-mandated transmission standard is necessary to ensure a prompt and orderly transition to digital. Thus, it urges the Commission to make a finding that a transmission standard is necessary to promote the development of DAB and to provide listeners the maximum benefit of DAB. The standard should include all of the technical elements of the IBOC DAB system necessary to ensure universal operability of receivers. As part of the standard-setting process, USADR urges the Commission to develop criteria and specify procedures for evaluating proposed IBOC DAB systems.

Finally, USADR asks the Commission to adopt a transition plan as proposed. ... Under this proposal, broadcasters will be able to immediately

adopt hybrid IBOC DAB. In order to ensure that the new digital signal does not harm existing analog service, USADR proposes that the Commission adopt separate AM and FM composite analog/digital emissions masks for hybrid IBOC DAB. After a twelve-year transition period, analog broadcasts would no longer be protected. In the case of FM, a new all-digital

mask would become effective at that time. The new FM all-digital emissions mask would allow the broadcaster to increase the power and bandwidth of the digital sidebands. In the case of AM, the all-digital signal will fit within the composite AM mask adopted for the interim hybrid period.

USADR urges the Commission to adopt these proposals as the best means to protect analog broadcasters and listeners and simultaneously promote the development of DAB.

## II. BACKGROUND ON USADR

### A. USADR Development Partners

USADR was established in 1991 by CBS Radio, Gannett Co., Inc. and Westinghouse Electric Corporation for the purpose of developing a digital broadcasting system for AM and FM radio. At that time, USADR invented the IBOC DAB concept and began its system development work. Since 1991, USADR has become synonymous with IBOC DAB. Today, USADR's development efforts draw on the resources of a diversified team of scientists and engineers representing major broadcasters, electronics equipment manufacturers and research universities. CBS is the general partner of USADR, and its subsidiary,

Westinghouse Wireless Solutions Company ("Wireless Solutions"), coordinates the overall technical development work and system design. ... USADR also is collaborating with outside parties that contribute additional expertise to USADR's development efforts. Xetron Corporation, a former Westinghouse subsidiary and now a subsidiary of Northrop Grumman

Corporation, provides USADR with technical support for the development and testing of the AM components of the USADR system. ... Fraunhofer Institut für Integrierte Schaltungen, the recognized leader in audio compression technology and psycho-acoustics, coordinates the audio compression development work for the USADR system and has provided critical integration of the MPEG Advanced Audio Coding ("AAC") codec for USADR's system. Fraunhofer is the leading organization of applied research in Germany and operates 47 research institutes with approximately 4,500 scientists and engineers. Fraunhofer had a leading role developing the most advanced audio coding schemes, several of which have been designated as worldwide standards, such as MPEG Layer - 3 and MPEG AAC. ...

As established broadcasters, USADR's parent companies have provided critical assistance tailoring USADR's efforts to maximize the benefits of DAB for broadcasters and the listening public. ...

### B. Development History

In the initial stages of developing its system, USADR quickly rejected the options for terrestrial DAB systems outside the AM and FM bands, concluding that these systems were

impractical due to a lack of available spectrum and the need for systems to work within the existing radio broadcast infrastructure. Non-IBOC proposals for terrestrial digital radio remain as impractical today as they were seven years ago for the same reasons. USADR has spent considerable time and resources since 1991 developing a system that is practical and presents few regulatory or administrative hurdles.

Unlike television, radio is inherently a mobile technology. Thus, any digital radio solution must be able to deliver high-performance levels for the fixed user in a home or office, as well as the mobile user in a car or listening to a portable radio. In addition, unlike digital systems designed for voice communications, radio must deliver high sound fidelity to meet the listening needs of the public.

During its first few years, USADR built prototype AM and FM systems which were designed to test the viability of IBOC. From 1992 to 1995, USADR operated experimental IBOC DAB systems in Cincinnati, Las Vegas, New Orleans, Chicago, Los Angeles, Monterey and Urbana, Illinois. These experimental stations demonstrated a digital signal could be simulcast with the host analog signal without affecting the integrity of either broadcast. USADR used these test results and subsequent studies to more fully understand the current interference environment in the AM and FM bands and the technical options available to meet the needs of the listening public.

In 1996, USADR initiated the final design phase for its operational system. USADR has established a dedicated DAB laboratory in Columbia, Maryland where it is in the final stages of its design and implementation work. USADR has characterized the AM and FM bands, used that information to re-engineer its prototype systems, and has designed an integrated AM and FM system which meets all the design goals established at USADR's inception. It is currently conducting tests using experimental stations in Columbia and Bethesda, Maryland and Cincinnati, Ohio to examine the transmission of digital signals in the analog broadcasting bands. Significant system simulations and modeling have been completed, and USADR is implementing new prototype hardware. Preliminary laboratory and field tests have begun. More comprehensive testing is scheduled to commence in the first quarter of 1999. Based on the advanced stage of USADR's development work and the expectation that commercial transmission systems will be available within 18 months, USADR has initiated this rulemaking to encourage the Commission to develop the rules necessary to quickly implement IBOC DAB.

## III. THE COMMISSION SHOULD INITIATE A PROCEEDING TO ESTABLISH RULES FOR IBOC DAB

### A. Digital Radio Broadcasting is in the Public Interest.

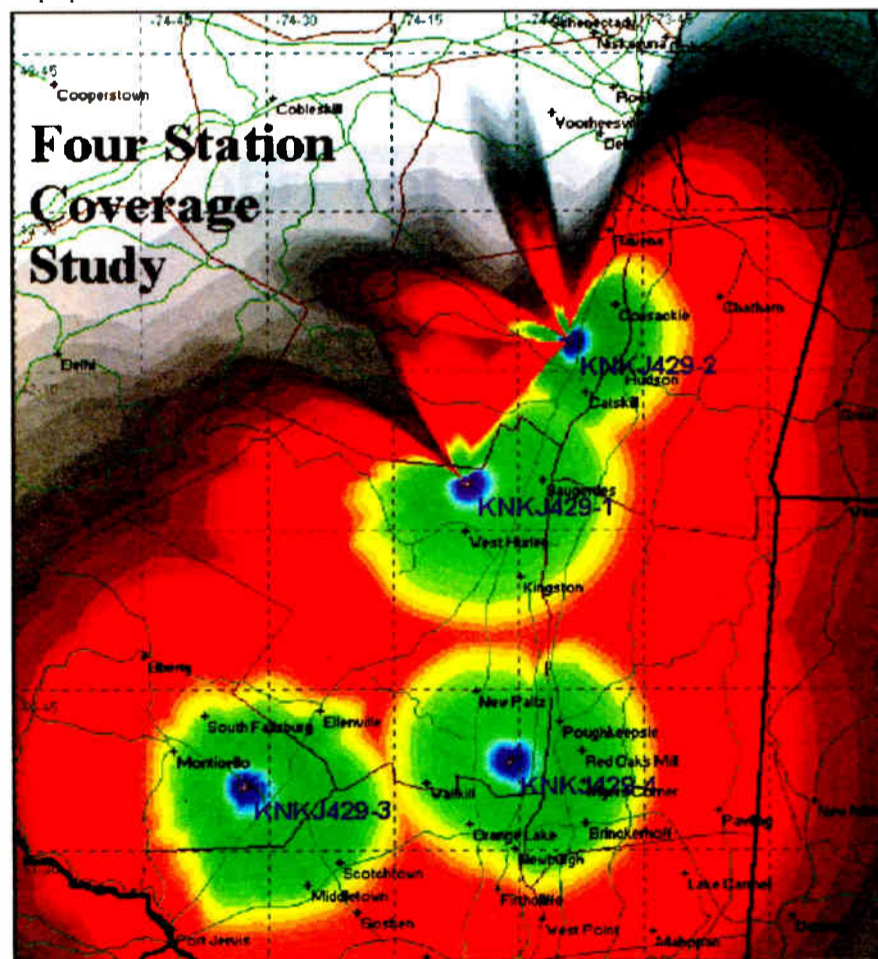
#### 1. Digital technology possesses significant advantages over current broadcasting.

The speed at which the public has upgraded to digital technology across a wide array of media reflects the recognition that digital technology possesses significant advantages over analog. The Commission has consistently supported upgrading analog systems to digital as technology has made that possible. ...

Currently, radio broadcasting in the United States is also being provided using technology whose intrinsic limitations do not permit further material improvement. The history of analog radio broadcasting in many ways mirrors that of analog television. Like analog television, analog radio has been the established technology for a considerable period of time. Since its invention in the 1920s, radio broadcasting has passed many milestones. During the most recent thirty-

See FILING, page 16 ►

## Any digital radio solution must be able to deliver high-performance levels for the fixed as well as the mobile user.



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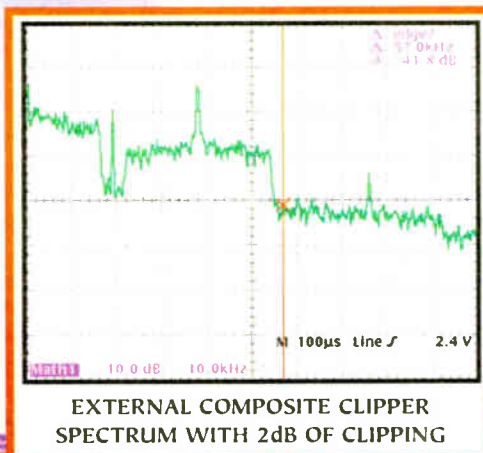
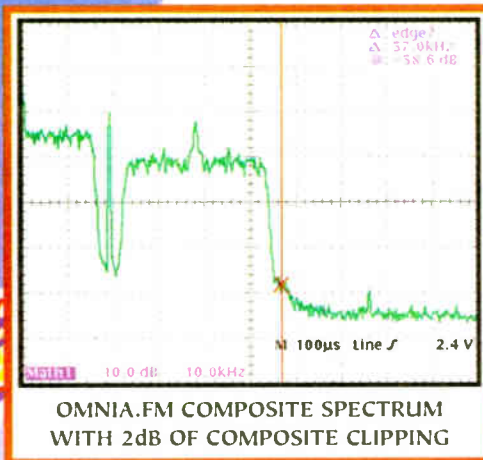
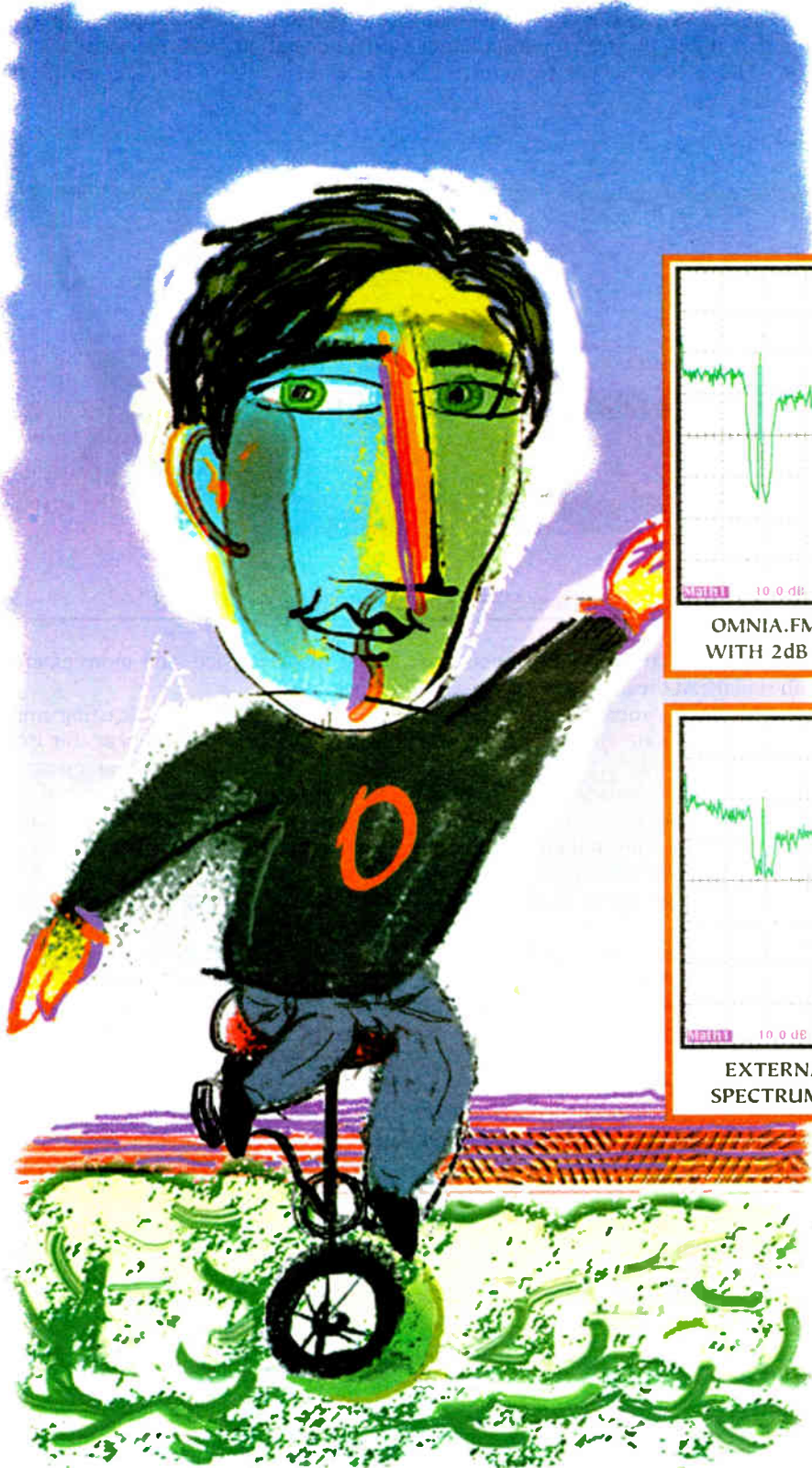
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For a complete technical report, call us for a copy of our paper entitled "Omnia.fm: An Engineering Study." Or visit our web site at: [www.nogrunge.com](http://www.nogrunge.com).



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World Radio History

# Canada Set for National DAB

► DAB, continued from page 1

A fifth transmitter has also been installed as a backup by Master FM, the local radio consortium that not only operates the DAB site, but the older combined FM transmission system on which it is based. The transmitters are controlled by software from Unique Broadband Systems, a Canadian company that also manufactured the DAB encoders.

## Toronto coverage

While the CN Tower DAB site only broadcasts an 800 W signal, it is delivering "excellent" coverage across Toronto, said Steve Edwards, vice president of corporate engineering and technology for Rogers Broadcasting.

Using a Pioneer DAB receiver-

have to be installed — configured rather like a "cellular telephone system," said Edwards — "to extend coverage out to today's protected FM contour." Right now, the Toronto DAB pattern is targeted at the city's core, with coverage to outlying areas decided by the landscape around the CN Tower.

Meanwhile, in Vancouver, British Columbia, two five-channel DAB transmission pods have been installed at the Canadian Broadcasting Corp. site on Mount Seymour. One of these carries the four publicly funded CBC networks, while the other has five private stations, said Edwards.

He said licenses are pending for other private broadcasters in Vancouver; once those are granted, the total number of

go digital, said Michel Fortin, a senior specialist engineer with CBC. As a result, broadcasters have ordered three 1 kW Iteco transmitters. One will serve as a standby.

All three transmitters will feed an antenna located on Mont Royal, near the city center. In addition, low-power gap-filler transmitters will be installed in the Ville Marie and Lafontaine tunnels, with more gap fillers planned for installation soon. These low-power transmitters

Vancouver, said Fred Benedikt, a senior engineer with CBC Broadcast Engineering Services.

The test datacasts have been simple, but intriguing. For example, by extracting information from the internal traffic and scheduling system used by the CBC, "we can identify the name of the program" on the user's DAB receiver display, said Benedikt, as well as any "other information we want to go along with it."

Right now such basic datacasts are all the two-line, 32-character displays of first-generation DAB receivers can handle. But successive generations will have

**The Canadian DAB audience is restricted to a few engineers with their own receivers, and radio executives taking tours in the Toronto DABug.**

equipped Volkswagen Beetle — known locally as DABug — he has been able to receive DAB broadcasts not only within the city limits, but throughout the suburban Toronto area as well.

For Toronto broadcasters, achieving this coverage has cost them about \$50,000 per station, measured in U.S. dollars. That amount covers their share of the DAB transmitter and tower; the audio feeds were already in place supplying Master FM's analog transmitters.

However, more expenses will be forthcoming. Eight more transmitters will

pod will rise to four.

In British Columbia, broadcasters are only using 200 W transmitters. The mountainous terrain of the Pacific Northwest makes it impossible to cover Vancouver with a single site.

## Vancouver, Montreal

Soon, additional 200 W transmitters will be installed on the Metrotown tower in the Vancouver suburb of Burnaby to provide adequate coverage throughout the metropolitan area.

And in Montreal, licenses were finally granted in late 1998 to allow broadcasters to

maintain DAB coverage in tunnels the main signal can't reach.

If everything goes according to the plan, "we will be on the air in the spring," Fortin said.

Canadian radio broadcasters are making significant progress toward launching DAB. However, one nagging question continues to hang over the whole enterprise: Who is going to listen to these broadcasts?

At present, the Canadian DAB audience is restricted to a few engineers with their own receivers and radio executives taking tours in the Toronto DABug.

## Receivers coming

However, this situation is about to change, said Roman. Pioneer, Kenwood and Sony have committed to have consumer-grade DAB receivers in stores "early in 1999," he said.

Receiver availability is crucial to the launch of DAB, said DRRI Executive Director David Garforth. To ensure the best chance of success, "we want to make sure that receivers are available and that they are available in sufficient quantity."

Of the receiver manufacturers, Pioneer has won praise for its support of Canadian DAB. Not only did it outfit the DABug, but the company also developed a DAB car receiver for the launch. Retail price is \$665 in U.S. dollars.

The trunk-mounted receiver is modular, said Peter Cos, car audio product manager for Pioneer Electronics of Canada, which means "any controller radio that has been built since 1994 can run our digital radio tuner box."

"That is a bonus," said Cos. "It means there are about 25,000 radios in Canada right now that can literally plug in and start receiving digital radio, if it is in their area."

But will Canadians fork out this much money for a car radio? They might, if they want the datacasting extras that accompany DAB.

For instance, the CBC has made experimental datacasts in Toronto and

more display space, and more extensive capabilities.

The CBC is test-broadcasting images which one day could appear, for example, on the monitor of a computer equipped with a DAB receiver card.

In the meantime, Duff Roman said he sees the Canadian DAB band being used for a variety of two-way data broadcasts, the return path being carried via wireless telephone.

Despite years of R&D, it remains to be seen whether the Canadian public will adopt digital radio as eagerly as the radio industry hopes. Canadians are watching as U.S. researchers pursue an in-band, on-channel DAB strategy. But whether such a system will pass the U.S. regulatory process, and how long it will take, is unclear.

Without their southern neighbors leading the way — as they did with analog radio and TV, and as they are with HDTV — it is hard to say how motivated Canadians will be to buy into this new technology.

Because so much is at stake, it is not surprising that Canadian broadcasters have adopted a slow and cautious approach to the launch of DAB.



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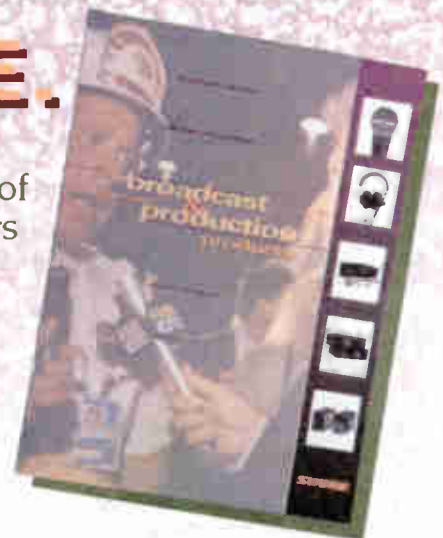


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# Excerpts of the USADR Petition

► FILING, continued from page 12

year period, however, technological change in analog radio has been confined to minor improvements in the basic analog technology. Thus, while it has been adapted over the years, it has reached a plateau of development, above which no material improvements are possible.

**2. DAB possesses many superior intrinsic features.** ... Its principal merits include enhanced sound fidelity, improved robustness, new radio features and the ability to provide enhanced auxiliary services. Digital radio can increase radio sound quality so that it more closely matches the original source material, particularly digitally recorded music. FM DAB provides the listener a sound quality that is virtually the same as a CD, which has become the standard dictated by the marketplace. AM DAB can provide sound quality comparable to today's FM.

This improved audio fidelity can be achieved in combination with improved "robustness" of the radio signal. Robustness refers to the ability of the signal to withstand interference from other radio broadcasts, multipath fading and noise. Improved robustness results in fewer holes within a station's coverage area. ... Interference and multipath fading together limit the robustness in the FM band. AM signals receive significant degradation from structures, as well as interference from atmospheric conditions and manmade and natural sources of noise. The digital processing of both the digital and analog signals in the USADR system will help overcome these problems and increase robustness

even in the interim hybrid mode when analog and digital signals are broadcast simultaneously. ...

The USADR system includes auxiliary services which are significantly more robust and higher quality than today's subcarrier services. Although market forces will determine the best auxiliary services to provide, USADR anticipates a growing demand for transmission of information as well as other point-to-multipoint digital services.

**3. The Commission has determined that the introduction of digital radio is in the public interest.** ... In its first Notice of Inquiry regarding digital radio, the Commission noted that digital modulation is increasingly common in radio telecommunications, including, for example, cellular telephones. It also recognized that digital audio media are developing rapidly, that the increased sound quality they offer is gaining acceptance by consumers, and that it is technically feasible. The Commission concluded: "We continue to support efforts to implement terrestrial in-band DARS technology. We believe that existing radio broadcasters can and should have an opportunity to take advantage of new digital radio technologies, and we are optimistic that technical advances will, in the near future, permit both FM and AM broadcasters to offer improved digital sound. To this end, we are committed to continuing our work with the broadcast industry to ensure that broadcasters are able to promptly implement terrestrial DARS.

More recently, in the satellite DARS proceed-

ings, the Commission reaffirmed its commitment to terrestrial digital radio. ...

As with digital television, the public interest would be served by the ability to deliver CD-quality sound and simultaneously correct some of the defects inherent in analog radio.

**B. IBOC Technology is the Best Means of Implementing Digital Radio.**

Just as the decisions made in the 1920s and onward enabled the growth and success of the present radio broadcasting market, so the choices the Commission makes as digital technology is introduced will define the parameters of radio service in the 21st century. ... It is of critical importance that the transition to a new audio delivery system provides the listening public with increased fidelity and sound quality as well as new and innovative digital transmission services. Also, it is vital that the migration from today's mature AM and FM transmission systems to a digital transmission system does not undermine the viability and stability of the existing AM and FM radio industry.

A new allocation of frequencies for terrestrial DAB is clearly not the answer. In many countries it is exceedingly difficult, if not impossible, to obtain access to any frequency band that has favorable propagation characteristics (e.g., UHF or VHF) for use by DAB, and there is no frequency available for this purpose in the United States. Sharing with existing users in the VHF or UHF bands in the United States would be impossible in light of the existing uses of these bands. The move to higher bands would dramatically increase the costs of the transmission system but might not necessarily improve sound quality. ...

There are several reasons why IBOC DAB should be the means of implementing terrestrial DAB in the United States. ...

**1. IBOC is frequency efficient.** ... It is well recognized that given the current congested use of the spectrum, it would be extremely difficult to accommodate new services. Therefore, regulatory agencies have indicated that they would look favorably on any proposal or technology that is spectrum-efficient. This important policy goal also should be applied to terrestrial DAB. Thus, a DAB system that does not require a new frequency allocation should be favored over any system that does. This is particularly important for radio, because it would be preferable to operate a terrestrial DAB system within the existing medium frequency and VHF bands, which offer more favorable propagation characteristics. IBOC DAB meets the spectrum efficiency goal since it does not require a new allocation of frequency.

**2. IBOC ensures a seamless transition from analog to digital.** ... IBOC technology allows consumers to continue to use analog receivers for an extended period of time. Therefore, it

minimizes disruptions and dislocations. USADR's system has been engineered to permit listeners and broadcasters to upgrade to digital at their own pace. Upgrade decisions can be based on the economic needs of local stations and local listener demand without the threat of abrupt disruptions in local service. Consumers ... will not face an immediate, across-the-board shift to digital technology. Similarly, the transition from hybrid to all-digital will be at the discretion of the broadcaster and driven by market forces.

IBOC's ability to provide a seamless transition from analog to the interim hybrid period, to the all-digital period, provides the additional public service of protecting the Emergency Alert System. ... By retaining the analog function during the hybrid mode, IBOC will ensure that segments of the population are not suddenly cut off from public safety announcements and disaster relief information.

**3. IBOC benefits radio listeners.**

IBOC DAB will provide listeners enhanced audio quality and additional services. It will also allow listeners to maintain their patterns of radio

use; listeners will continue to find stations at their existing dial position. Moreover, the receiver will possess the same outward features and functions as analog radio.

IBOC DAB receivers will be affordable to the average consumer. If the promise of terrestrial DAB is going to be realized, the cost of the DAB receiver, when produced in large volume, must be low enough to be affordable to the average consumer. Before broadcasters are going to commit to upgrade to terrestrial DAB, they need assurances that listeners will have reasonable access to DAB receivers. USADR's IBOC terrestrial DAB system was designed to provide a cost-effective means for listeners to upgrade to digital.

**4. IBOC benefits broadcasters.**

IBOC preserves broadcasters' investments in AM and FM stations during the transition from analog to digital. At the same time, IBOC ensures equal opportunity for both AM and FM broadcasters to access new digital technology. If FM broadcasters were provided the opportunity to upgrade to digital, but AM broadcasters were denied a corresponding opportunity to upgrade, it would create a further economic dislocation between AM and FM broadcasters. ...

Another benefit of IBOC is that it will not require the development of a new broadcast infrastructure. For broadcasters, their studios, towers, antennas and much of their equipment will remain unchanged. Each station will require a new exciter, but some stations will be able to upgrade to IBOC DAB without replacing transmitters. While such costs are not trivial, all such upgrades could occur through the normal life and maintenance cycle of radio broadcasting equipment. Thus, the timing and the capital investment required to implement IBOC DAB avoids any comprehensive and financially disastrous obsolescence of radio broadcasting assets. The flexibility inherent in IBOC provides additional opportunities and protection for broadcasters. Digital radio can be phased in based on market demand or as part of the broadcaster's normal equipment replacement cycle. There will be many broadcasters that choose to upgrade as soon as possible, but IBOC will provide additional time for many who, for financial or other reasons, chose not to upgrade quickly.

**5. IBOC will facilitate the introduction of enhanced auxiliary services.**

The digital bit stream used for audio broadcasting in the IBOC system also supports auxiliary services. USADR has engineered its system to permit upgrades of existing subcarrier services using datacasting capabilities, which provide for both program associated data as well as new or upgraded ancillary data services. By upgrading existing subcarrier-based services and offering a means for introducing new services, IBOC DAB will serve the public interest.

**6. IBOC minimizes regulatory burdens on the Commission.**

... Unlike the introduction of other digital technologies, the introduction of IBOC DAB will impose minimal administrative burdens. There is no requirement to allocate new spectrum for DAB or to license service providers. Once a DAB system is adopted as a standard, the Commission's responsibilities will be limited to the need to implement interference criteria for the new digital broadcasts and adopt a transition plan ...

**7. USADR has demonstrated the technical viability of its IBOC DAB technology.** ...

Additionally, USADR provides independent verification of its internal analysis. A report prepared by R.L. Pickholtz, Ph.D. and B.R. Vojcic, D.Sc. concludes that "IBOC FM/DAB will result in CD-like quality" and that the interference from the host DAB to the host FM and first adjacent channel FM is minimal in most operational scenarios." The Pickholtz and Vojcic report further confirms "the feasibility of the [AM] engineering design." ... Collectively, this information demonstrates the technical viability of IBOC DAB.

The next installment will appear in the Feb. 3 issue of RW.

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FIRST PERSON

# Mexico, ISDN and the NFL

Mike Simpson

Every year around May, rights holder radio stations of National Football League broadcasts wait in anticipation for the announcement of next season's professional football schedule. What exciting and exotic destinations might the NFL decide for the upcoming season? For those of us at Midcom, anticipation is often replaced by sheer terror.

Midcom Inc. of Irving, Texas, is responsible for technical production services and remote broadcast facilities for the KVIL/Dallas Cowboys Radio

Network requires full audio spectrum frequency response (20 Hz to 20 kHz) with stereophonic transmission. Four parabolic microphones and a roving reporter roam the sidelines, seeking to capture the realism of the game and the "you are there" feeling. Stereo crowd microphones, along with a few special offerings from our bag of tricks, make our broadcasts unique in NFL radio.

Due to geographic location, C- and/or Ku-band satellite audio backhaul is virtually impossible from Mexico City. This is due to poor "footprints" in Mexico when trying to use domestic birds and the high

perfect. We cannot thank him enough.

TelMex, once the national telephone company for all of Mexico, is now privatized, with SBC as a strategic partner.

from Mexico City to Dallas produced quality equal to that of local calls. (This proved to be a wonderful thing, as we used POTS codecs for our backup transmission) However, due to regulatory issues at the time, TelMex was unable to cross the U.S. border with switched digital traffic.

After negotiations consisting of hun-



Estadio Azteca in Mexico City

Network. For the past eight years, Midcom has originated broadcasts of nearly 200 games for "America's Team." In addition to three Super Bowls, numerous playoff and championship games, our crew and equipment have covered six NFL pre-season games called "American Bowls" in Tokyo, London and Toronto, and made three trips to Mexico.

We were first tantalized by the possibility of using ISDN for backhaul transmission in 1992, when exposed to the technology during our trip to the Tokyo Dome in Japan. Like much of Europe, KDD Telecommunications of Japan had been using ISDN for several years prior to its use in the United States.

Only a year later, we found ourselves head-deep in ISDN, using it to broadcast games from England and Canada and eventually for all domestic Cowboys broadcasts. But Mexico? That was an entirely different, and supposedly impossible, situation.

The KVIL/Dallas Cowboys Radio

costs of time and facilities associated with Mexican satellites. We previously had used the all-digital Inmarsat B service during a remote broadcast from a moving cruise ship in Caribbean and Mexican waters (another Midcom first, accomplished in 1993 before Inmarsat B was commercially available), but with current rates for a single 64 kbps channel still over \$10 per minute, another avenue for high-quality audio transmission had to be found.

In late 1996, a chance Internet meeting on the Texas ISDN Users Group put us in contact with Mike Reddout, a Southwestern Bell Corp. (SBC) representative on assignment at TelMex Headquarters in Mexico City. Reddout put us in touch with Dan Norris, also from SBC in Mexico City, who managed every facet of the project. Without Norris, the ISDN broadcast would have been doomed from the beginning. He took both a personal and professional interest in making sure everything was



TelMex and SBC were eager to use a major event such as a Cowboys game to highlight the rollout of a Mexico ISDN offering. The chosen event was the Aug. 17, 1998, Monday night game between the Cowboys and New England Patriots.

We were, of course, delighted with the possibility. After all, ISDN is s-o-o-o-o easy, right? Well, not everywhere.

**Power of equality**

TelMex has an excellent backbone network infrastructure throughout most of the country. With few exceptions, state-of-the-art fiber optics carry signals in a

dreds of e-mail exchanges and phone calls, it was decided that Sprint would become involved in the project to handle the international portion of the transmission. Sprint provisioned three Primary Rate ISDN circuits (23 "B" or bearer channels and 1 "D" or supervisory channel each) from its switching center in Fort Worth, Texas. These three PRI circuits were routed via T1s along the domestic Sprint network to its facility in McAllen, Texas.

At McAllen, the T1s were converted to E1s — Mexico uses the European E1 standard of 29 "B" channels and 1 "D"



Mike Simpson, left, checks spectral analysis with RF engineer Chuck Adams.

virtually zero-loss, digital environment, in some cases with far more modern facilities than are used by some carriers in the United States. Voice calls dialed

channel — and sent across the border to the TelMex facility in Reynosa, Mexico. From there, the three PRIs were routed to

See ISDN, page 18 ▶



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# Making ISDN Work From Mexico

► ISDN, continued from page 17

Mexico City over the TelMex network: one to the TelMex Maquette laboratory, another to the game venue at Estadio Azteca, and the third as a spare.

First at the lab and later at the stadium, a team of TelMex engineers and technicians and I, along with several equipment vendors, spent many days and hours trying to convert the PRIs into several ISDN BRI (2B + D) U-reference circuits. These were needed by conventional U.S. terminal adapters and the Musicam USA Prima 120 codecs that would be used to broadcast the game.

Several hurdles and many versions of telco equipment later, the Nortel

Meridian One PABX switch proved to be the perfect choice for the Mexico City side of the operation. Error-free ISDN connections were enjoyed for the seven-hour broadcast. The remote went off without a glitch via ISDN.

In case the ISDN lines didn't work, we needed a good backup plan. Musicam USA came to the rescue. David Lin and company graciously loaned us six Field Phone II POTS line codecs.

Why use six codecs? Remember, our Cowboys transmission had to be in stereo. Once again, new ground was about to be broken.

We used three Field Phone IIs at each end: one each for the left, center and

right channels. Play-by-play and color commentary announcers were assigned to the center channel only, with the stereo effects, parabolics and crowd microphones placed on the left and right channels. As good as the TelMex dial tone lines were, differences in the routing of each call caused the signals to reach Dallas at widely differing times.

Midcom Vice President Jeff Jones, shown at the Midcom Network Operations Center in Dallas, resolved the timing issue by utilizing the digital delay program of a Lexicon 480L effects processor. The channel that arrived first was assigned as the center. Jeff then independently further delayed the left and right channels to

match the center voice channel.

While not truly a "phase-coherent" stereo signal, the random nature of the crowd and ambiance at the stadium yielded a realistic stereo image. Thanks to the quality of the TelMex dial tone lines and the excellent data rates, we got 8 to 10 kHz frequency response, producing the first-ever stereo POTS line backhaul transmission.

**While not truly a 'phase-coherent' stereo signal, the random nature of the crowd and ambiance at the stadium yielded a realistic stereo image.**

In the intervening months since the NFL American Bowl, ISDN offerings in Mexico have become somewhat easier. TelMex now has agreements in place with some U.S. carriers, allowing switched digital traffic to be passed across the border. This eliminates the rather complicated private-line, T1/E1 arrangement utilized from Sprint.

TelMex also now has the ability to provision the ISDN/BRI service directly from its central office switch. The "last mile" of the circuit is delivered to the customer as an "S/T" interface, with the NT1 provided by TelMex. U.S. broadcasters with internal NT1 equipment, requiring the North American standard "U" reference interface, need simply to bypass the TelMex provided NT1 and connect directly to the ISDN/BRI two-wire pair.

■ ■ ■

*Mike Simpson is president of Midcom Inc. Contact him at (972) 869-2144.*

## About Midcom

Midcom Inc. was founded in 1973 by Mike Simpson as Midcities Communications to offer solutions in wireless microphones, intercom and radio communications systems designed for the broadcast and motion picture industries.

Midcom celebrated its 25th year in 1998. Still focused on audio and RF for broadcast and teleproduction, it offers sales and rental services, and operates a 48-track digital/analog mobile recording and production facility. It has received two Emmy awards and a gold album for live recordings, including opera star Placido Domingo and rock and roll artists Anthrax.

Midcom's NFL ISDN Cooperative provides ISDN-based backhaul transmission for nine NFL radio broadcast rights holders. Using a cost-shared approach for facilities at each NFL stadium across the country, the co-op offers an alternative to commercial backhaul providers.

Midcom was chosen in 1992 to provide remote broadcast origination services for the KVIL/Dallas Cowboys Radio Network and was the first to use ISDN-based backhaul for NFL radio.

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A one input/four output design that includes a four-segment LED input meter, individual trim pots for input and output levels, and Euroblock terminal connectors for quick installation. Precision circuitry yields THD+Noise of less than .009%.

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PRODUCT EVALUATION

# PressMite Goes Where the News Is

Paul Kaminski

Whirlwind has a mult-box that goes where you go.

A fixture at major news conferences, whether at a presidential appearance or sporting event, is the microphone distribution system, otherwise known as the mult-box. This device allows reporters to connect to a microphone- or line-level sound output and get an audio feed of the proceedings.

Organizers like mult-boxes because they eliminate the clutter caused by a forest of microphones and mic flags, and draw attention to their logo and the news maker. If there are security concerns, as with many government leaders, the mult-box may be the only access to sound a reporter will have.



Whirlwind PressMite

**Power up**

Most mult-boxes run on 110 VAC, and would require special arrangements for field use. Whirlwind's PressMite mult-box is a battery-operated unit, which allows use in places where power might not be readily available, as well as everywhere a regular mult-box can be used.

The PressMite is powered by two 9 V batteries. Whirlwind estimates you can expect eight continuous hours of operation with fresh alkaline batteries. The

PressMite has one input, switchable from mic to line level, and 14 transformer isolated outputs — 12 XLR male mic level, two XLR male line level. It has an output level control, a headphone jack and volume control for monitoring. Phantom power is available if you wish to connect

nected almost everything, from microcassette recorders to MiniDisc units to television Betacam recorders.

**Fresh batteries**

The unit has a rated frequency response of +/- 3 dB from 15 Hz to 20 kHz. We heard no artifacts that would degrade audio, as long as the batteries were reasonably fresh. When the batteries began to lose strength during the end of the winner's post-race news conference, we heard artifacts. That could be

**We tried the PressMite in Roger Penske's interview room during the Pepsi 400.**

fixed by trying lithium 9 V batteries; other than that, a change of batteries before that major news conference would work.

Speedway Public Relations Director Tommy Cameron assigned an assistant to work with us on the test. The PressMite's instructions were straightforward: the training period took less

**Product Capsule: Whirlwind PressMite**

**Thumbs Up**

- ✓ Compact, rugged
- ✓ Extremely easy to set up and use
- ✓ Clear, clean sound
- ✓ Battery powered
- ✓ Headphone monitor

**Thumbs Down**

- ✓ Batteries can run down, causing glitches
- ✓ Plug-on wireless transmitters take up outputs

For more information contact Whirlwind in New York at (800) 733-9473 or (716) 663-8820, send e-mail to [sales@whirlwindusa.com](mailto:sales@whirlwindusa.com) or circle **Reader Service 81**.

than three minutes. We also used the PressMite to distribute sound from a portable public address speaker set up in one of the garages. Once the requisite XLR-to-1/4-inch connector was located, the system was connected and quality sound was available there, as well. Once a proper level was set, the operator literally could set and forget the PressMite until the conference's conclusion.

Twelve mic and two line outputs would seem to be enough for most applications. See PRESSMITE, page 20 ▶

**Multi-Box Etiquette**

We still see users who are befuddled by mult-boxes. One day at the Indianapolis Motor Speedway, a producer for a syndicated morning show was confronted with a problem and solved it by yanking mic cords. That cost me part of an interview. Such acts of negligence border on professional discourtesy.

We hope these tips, gleaned from years of experience, can keep others from making such errors.

1. Know which cord is yours, and leave others alone. If you yank someone else's mic cord from the mult-box, you commit an act of negligence. Mark yours with a colored tape, or tape a business card to the cord.

2. Don't adjust audio levels on the mult-box. Ask a representative of the organizer to get the sound technician.

3. Make sure you have the appropriate adapter for your recorder.

The professional standard for a mult-box output is XLR male, so an XLR female to your recorder input will work with those boxes. This will keep you from having to stick your microphone up to a speaker, which looks unprofessional when a functioning mult-box is in use, and obviously affects the audio quality.

These adapters are available from broadcast distributors; the fabrication of those cords is a good learning pro-

ject for an engineering intern. Some mult-boxes have 1/4-inch jacks, 1/8-inch jacks and RCA jacks for outputs. But the XLR female to your recorder connector is the best way to go when dealing with a professional mult-box.

4. The usual problem with a mult-box that has level switches is with the user. Nothing will fry your audio more quickly than putting a line-level feed into your recorder's mic input. Check that the input switch is in the microphone position, usually denoted by "M" or "Mic."

A nice feature of the Whirlwind PressMite is that, with 12 designated mic-level and two line-level outputs, no switches need to be flipped.

5. On some mult-boxes, the Lectrosonics plug-on transmitters used by many television reporters take up more than one space each. A 12- to 18-inch XLR male-to-XLR female connecting cord will solve this problem, until manufacturers begin to increase the spacing between outputs on future iterations of mult-boxes.

6. If you are an organizer, ensure that the audio feed is to broadcast standards, and that all users observe these rules of professional courtesy.

— Paul Kaminski



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and 3/4-inch (M19) metal studs or bolts.

For more information, contact Panduit in Illinois at (630) 990-0220; fax (630) 990-2556 or circle Reader Service 107.

## Power Triodes

Models 3CX2500A3 and 3CX2500F3 are two of the newest tubes being offered by Svetlana Electron Devices.

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Better mechanical rigidity and long-lasting concentricity of the filament are the results of the improved mesh filament. Linearity, less noise, reduced warm-up variation and longer life can also be expected. The 3CX2500F3 has flying leads for the filament and grid connections that eliminate the need for a socket in low-frequency RF and audio modular applications.

For more information, contact Svetlana Electron Devices in California at (650) 233-0429; fax (650) 233-0439 or circle Reader Service 159.

## Warning Lights

Jasoni Electronics offers retro-style studio warning lights to protect radio broadcast studios from unauthorized entry while "hot."

Readily available products include "On The Air" and "Recording" legends, and others are available upon request. Either message is available in English or Spanish and other languages upon request. Standard colors are black and white, with other colors available. The signs can be colored silver for an additional \$20.

The 14-inch-long signs feature red transfer lettering. Each unit is supplied with standard-type long-life lamps.

An interface unit is available to control the lights from a logic voltage

of 5 to 35 V. The unit is programmable to offer steady- or flashing-light operation.

For more information, contact Jasoni Electronics in Nevada at (702) 791-3394 or circle Reader Service 133.



## At the Races With a Mighty Little Box

► PRESSMITE, continued from page 19

However, when the television people start plugging their wireless transmitter boxes to the XLRs, it reminds us of the "wall-wart" problem. The spacing on most multi-boxes is kind of narrow, so the box-style wireless transmitters take up more space than that required for an XLR female connector. That is the case with the PressMite, as well. On our factory tour, we spoke with Al Keltz from Whirlwind's technical support staff about this, and he noted our concern.

Whirlwind's list price for the PressMite is \$1,299. The street price for the unit is lower at many dealers. Whirlwind also makes the PressPower multi-box, with two mic/line inputs, four line outputs (two variable), and 12 mic outputs. It is powered by 110 VAC or four 9 V batteries. That unit retails for \$2,500.

We have suffered with multi-boxes that produced borderline static, nearly

unusable audio. The PressMite, by comparison, was clean and easy to use.

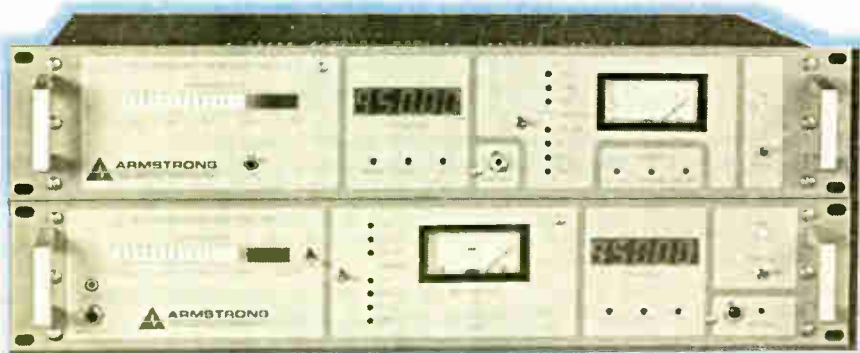
As a main, medium-sized multi-box, or as an outboard auxiliary box for large conferences, the PressMite works well. It is easy enough for a nontechnical person to set up and operate. Just remember that the batteries won't last forever; replace them before the audio degrades. A little vigilance, and maybe a set of lithium 9 V batteries, will keep the audio feed clean.

If you are called upon to set up a press pool audio feed and you need portability and flexibility in distributing the main feed, the PressMite will solve that problem. People like me who depend on them will thank you.

■ ■ ■

Paul Kaminski is the news director for the Motor Sports Radio Network, and contributes reports to other broadcast organizations. His e-mail address is motorsportsradio@compuserve.com

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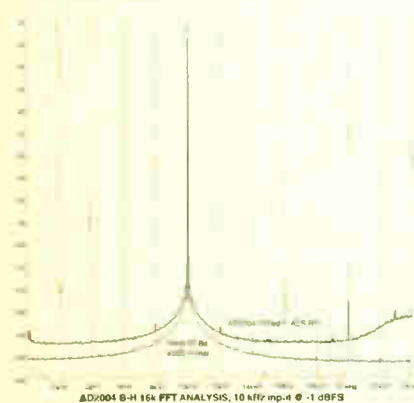
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**SBE NEWS**

# SBE Celebrates 35 Years of Growth

**John L. Poray**

*RW regularly provides space for commentary from the Society of Broadcast Engineers as a service to the industry. In this issue, Executive Director John Poray writes of the accomplishments of the Society in its 35 years.*

On April 5, 1964, the first official meeting of the Society of Broadcast Engineers was held in the Williford Room of the Conrad Hilton Hotel in Chicago.

As 1999 rolls around, SBE has much to celebrate as it recognizes its 35 years in existence.

The meeting was held during the NAB Convention with about 100 broadcast engineers from around the country in attendance. Their first decision was to change the organization's name from the Institute of Broadcast Engineers to the Society of Broadcast Engineers. Some thought that IBE was too close to the International Brotherhood of Electrical Workers (IBEW) and would be confused with the giant union organization.

SBE has grown tremendously since that first meeting in Chicago. There are now more than 5,400 members in 105 chapters in the United States and its territories and 30 countries around the world.

Members can be found in such out-of-the-way places as Mongolia, Fiji and Sri Lanka. Chapters are operated by volunteers and elected by local members. Members elect national officers and a board of directors who determine the direction of the organization and set policy. A small professional and support staff, with offices in Indianapolis, oversee the day-to-day operation, administering the programs and services authorized by the Board.

SBE was organized for the working engineer at a broadcast station — people who needed to know how to build, repair and operate the latest broadcast equipment. They need to know how to keep a station on the air through all conditions and deliver the best possible technically excellent product to listeners and viewers. Although technology has changed dramatically over the years, the need for engineers to keep on top of current and new technology is more important than ever.

The SBE mission has always primarily been education of the broadcast engineer and the advancement of broadcast engineering as a scientific field. The Society's programs were developed along those lines: the creation of SBE chapters offered the opportunity for members to meet, discuss and solve mutual technical problems, hear presentations from equipment and product manufacturers and tour area station facilities.

Seeing the need to evaluate and recognize broadcast engineering personnel on technical merits, the Society launched the industry's first certification program in 1977. Open to members and non-members alike, the first group of eight broadcast engineers to sit for exams was certified in that July. In the beginning, certifications were offered for Associate Broadcast Engineer, Broadcast Engineer and Senior Broadcast Engineer.

The Associate level was later dropped,

but new levels of Broadcast Technologist, Professional Broadcast Engineer, Broadcast Engineer Audio and Broadcast Engineer Video were added.

Non-engineering certifications for Radio Operators and Television Operators were created in the mid-1990s for those working entry-level board operator positions. Now, more than 3,500 individuals hold a certification from SBE, including 30 people outside the United States.

## Educating our own

SBE has encouraged and promoted the continuing education of broadcast engineers since its earliest days. The SBE educational foundation, the Ennes Educational Foundation Trust, regularly presents day-long workshops around the country on the latest technology. The Ennes Trust also funds several scholarships, awarded annually to those seeking to further their education or to high school and college students interested in a broadcast engineering career.

Seeing the need for management training, SBE resurrected the Leader-Skills Seminar for broadcast engineers. Sponsored for 28 years by NAB, the program ended in the early '90s. SBE

work with the cooperation of licensees to manage the effective use of the BAS bands. It is an example of a private initiative providing a needed service with no taxpayer dollars. Recent actions by Congress to designate part of the BAS 2 GHz band for other uses will make the coordination process even more vital.

Though choosing not to be a standards-setting organization, SBE has been involved in speaking on behalf of broadcast engineers on regulatory issues. Comments on FCC rules and proposals have been submitted by SBE on a variety of issues.

Through its volunteer FCC Liaison Committee and with guidance from its legal counsel, SBE has filed comments to the FCC no less than 57 times since 1988. Issues such as use of the 2 GHz ENG band, RFR, FM licensing, FM Peak Modulation, Unattended Operation, Digital Audio Radio Services and EAS have been addressed by SBE. SBE has become a sought-after source by the FCC and other federal agencies for expert, objective opinions on technical broadcast issues. SBE efforts have certainly had a positive impact on many issues.

## Success in rights

For several years, SBE has fought on a state-by-state basis to protect the right of broadcast engineers to use the term "engineer." This has been successful in every case thus far. Most recently, SBE offered

**SBE has had its share of failures as well as successes. But after 35 years, it continues to improve the professionalism of the individual broadcast engineer.**

brought it back in 1997 and will hold its third five-day seminar in June of this year.

Since 1995, SBE has worked with NAB as co-presenter of the NAB Broadcast Engineering Conference, held each year during the NAB Convention in Las Vegas. The BEC is the premier broadcast engineering educational event in the world, with five days of technical papers, panel discussions and keynote speakers. Thousands of broadcast engineers make the trek to Las Vegas each spring to take in the convention.

For those and many others who can't make the trip to Las Vegas, no fewer than eight SBE chapters present regional conventions each year with several others providing assistance in organizing technical sessions for state broadcasters' conventions. Approximately 4,000 broadcast engineers take part in these regional events each year.

On a national scale, SBE has been instrumental in other areas that have benefited broadcasting as a whole. Beginning in the late 1970s, coordinating frequency use in the Broadcast Auxiliary Service (BAS) bands became a necessity as interference problems multiplied with the tremendous growth in their use.

Today, more than 175 volunteer Frequency Coordinators, most operating under the national SBE umbrella and responsible to their local SBE chapters,

its assistance to Novell, in its suit against the State of Illinois Department of Professional Regulation in that state's appellate court. SBE filed a "friend of the court" brief on Novell's behalf, arguing against the state's desire to reserve the use of the term "engineer" only for those who were registered Professional Engineers in that state. The court ruled in favor of Novell and SBE, though further challenges may go to the Illinois Supreme Court.

SBE has had its share of failures as well as successes. But after 35 years, it continues to work to improve the professionalism of the individual broadcast engineer and gain the respect that broadcast engineers deserve. Membership has shown consistent growth for six consecutive years in the face of a shrinking and changing market.

The SBE challenge is to continue to anticipate changes in broadcasting that affect the broadcast engineer. It will continue to work to provide educational and other benefits which help members meet challenges that change brings and reach a higher level of success in their professional careers.

John L. Poray, CAE, is executive director of the Society of Broadcast Engineers, headquartered in Indianapolis. Reach him via e-mail at [jporay@sbe.org](mailto:jporay@sbe.org)

RW welcomes other points of view.

# Workbench

Radio World, January 20, 1999

## Iron + Wood = Custom Shelving

John Bisset

As we patiently wait for our capital budgets to be approved, the list of projects and things we need to do keeps expanding. How, as engineers, do we juggle everything?

Improvisation, of course.

Rather than look for custom computer shelving, Ralph Messer and James Belt of West Virginia Radio Corp. took some leftover angle iron and a piece of plywood painted black, and fabricated the shelf in Figure 1. Slots were cut in the plywood to fit around the rack rails. The finished product in Figure 2 can't be beat for price and versatility.

Ralph had heard of mounting a rack shelf upside down, on the front of a rack, so the "tray" protrudes from the front. This approach would be fine for a monitor or keyboard, but not to support the entire computer. That's when the plywood approach surfaced.

When not in the wood shop, as we mentioned recently, Ralph and James are busy

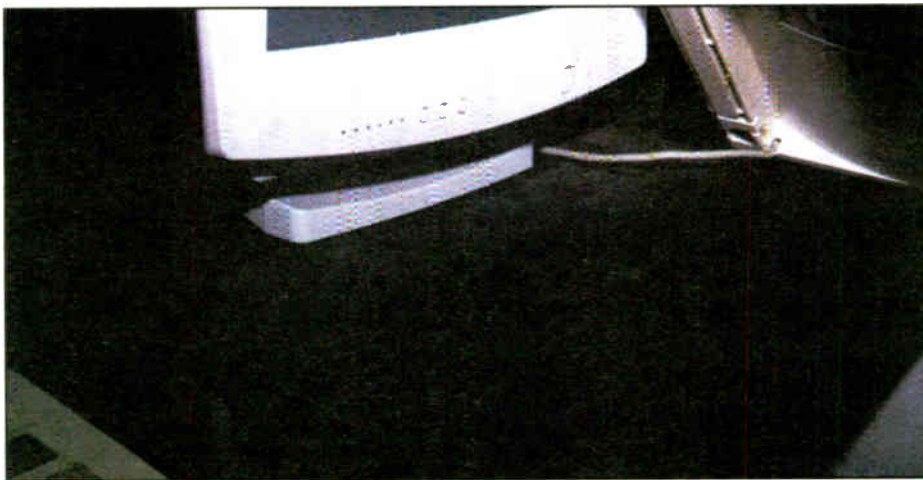


Figure 1: Angle iron and plywood make for an inexpensive rackmount stand for a computer, monitor or keyboard.

and stays disconnected until the fault is corrected. Once the fault is removed, the device instantly resets — something a fuse cannot accomplish.

Not only does the Speaker Knife protect all driver types, plus crossovers, from dangerous transients, it also protects from

Jack Drake at KIBC(FM) in Burney, Calif., sends a plea to *Workbench* readers.

He is looking for a service manual or schematic for a Sparta Record/Playback cart machine. The Model is 4610. If you can help, contact Jack at (916) 335-5422. Thanks for lending a hand!

\*\*\*

Kevin Block from KMAJ-FM in Topeka, Kan., writes that he is experiencing the same weekend ESPN tone problems as previously discussed in this column. He has also contacted ABC, and was told there were "no problems found." In Kevin's case, the problem has become so unreliable that he is now using timed events to trigger his breaks, and has dropped the tones altogether on Sunday night.

Dick Boekeloo from db Broadcast Services writes about the same problem. His Netcue II-As are very level-sensitive to the FSK decoder. The Encore 19-01 Data Channel comes out See WORKBENCH, page 24 ▶



Figure 2: Shown are the completed computer rackmount stand and labeled ISDN gear.

labeling their facility. The P-Touch labels on the equipment faces in Figure 2 don't just identify circuits they are connected to — in the case of the Zephyrs, they include phone numbers and SPIDs as well.

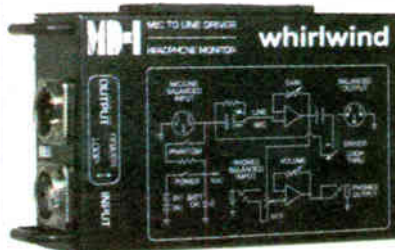
\*\*\*

Tired of replacing blown speaker in the control room or in your remote gear? Dynastar, which released a high-speed transient protector about a year ago, now has unveiled the Speaker Knife II. Once triggered, the SK-II cuts the audio out

power overload (blown speaker coil) and amplifier failure (pure DC), and helps reduce a fire hazard. Built in a weather-proof case, the SK-II is trigger adjustable, permitting the selection of the trigger point to compensate for low- to high-power applications. The SK-II uses no batteries, and there is no loss in frequency response or dynamic range. For more information, contact your equipment distributor, or call Dynastar at (209) 433-9700.

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## FEED LINE

# Tower Registration Compliance

W.C. Alexander

Last summer, FCC Compliance and Information Bureau agents made a sweep of quite a number of cities checking on antenna structure registration compliance. The results of this sweep were announced recently. According to the FCC, 368 of the 1,331 structures audited — 28 percent — were not registered as required by FCC rules. An incident in which an air ambulance experienced a near-miss with an unlighted tower near Muleshoe, Texas, has added to concerns about tower registration compliance.

There is nothing particularly hard about tower registration. File the registration, post the registration number in the vicinity of the tower base, and maintain tower marking and lighting as specified. Three easy steps, and most broadcasters have complied fully with all three.

A few, however, clearly have not. It is their non-compliance that likely will trigger another round of inspections this winter and spring.

## Interpretation

One thing for which broadcasters and tower owners must be on guard is the broad spectrum of interpretation of the antenna structure registration rules applied by FCC Compliance and Information Bureau (CIB) personnel in the field. Here's an example:

Early last June, FCC CIB personnel from the New York City field office showed up at one of our stations in Albany, New York. We have a three-tower DA at that location. The field agent asked to see the tower registrations, which our local station personnel provid-

A few days later, I received a letter from the FCC in New York notifying me of the "violation" and asking what action had been taken to remedy the situation. I promptly responded in writing, restating all that our CE had told the field agent



The FCC said of this site, 'The Antenna Structure Registration Number was not displayed in a conspicuous place so that it is readily visible near the base of the antenna structure.'

and noting that all applicable rules had been fully complied with. I never heard another word. We did not wire around the shorted Austin transformer; the tower stayed dark a couple more weeks until the new one arrived. It was installed, the tower lights reactivated and the FAA notified. End of case.

between the tower owner and the field office. To satisfy the local FCC agents, the owner finally had yet another sign made and posted this one outside the gate on the road leading to the site — not exactly "near the base of the antenna

structure," but evidently what the FCC locals wanted to achieve "compliance."

At yet another FM site across town, another inspection took place that day. This time, the registration number was posted on the front of the transmitter building, which is located directly in front of the tower. The tower owner received a letter citing violation of Section 17.4(g), and also Section 17.21, which has to do with proper painting and lighting. The tower not only was properly marked with the registration sign but also was properly lighted; and the paint was well within the limits of the chart for col-

or and reflectivity. A round of letters went back and forth and the matter was dropped.

On the other side of the country, one of our sites in Portland, Ore., was visited this fall. This particular site is a three-tower DA located on a densely wooded mountaintop with one tower on top next to the transmitter building and the other two towers located down a steep trail on the mountainside. The inspector and our CE negotiated the trail and looked at all three towers and their registration signs. The agent then politely told the CE that all was in order and left. Interesting that there were no registration signs outside the locked site gate, and yet this FCC agent deemed the site to be in full compliance.

## Letter of the rule

All this is to illustrate a point: FCC CIB field agents do interpret the rules differently from office to office (and in the case of the Albany inspections, from site to site). It may be impossible for you to please every inspector that may come down the road.

So what do you do? Simple: comply with the letter of 47 C.F.R. Section 17. Even if a particular FCC agent makes an issue of something, if you can show where you are in full compliance with the rules as written, as opposed to the rules as interpreted by the CIB agent, you are on solid ground.

You also have another resource at your disposal: FCC General Information Bulletin "General Posting Guidelines." This is available from the FCC and is accessible on its Web site at [www.fcc.gov/wtb/antenna/antguide.html](http://www.fcc.gov/wtb/antenna/antguide.html)

The important thing for broadcasters is that we keep our own house clean and know that we have done what we must to comply with the rules. Having done that, we can sleep a little better at night, knowing that, legally at least, we are on solid ground.

■■■

*Cris Alexander is director of engineering for Crawford Broadcasting in Dallas and a regular contributor. RW welcomes other points of view.*

## Broadcasters must be on guard against broad interpretations of the rules as applied by FCC compliance personnel.

ed. Our CE asked the inspector if he wanted to go to the tower bases to see the registration signs, but he declined.

Then the agent looked out the back door at the towers through the rain and noted that one of the towers was not lit. Our CE showed him the log noting where the lights had failed, showed him the notation of the required FAA notification, then explained that an Austin Ring transformer on that tower had shorted and that a replacement had been ordered.

We clearly were in complete compliance with all pertinent FCC and FAA rules, yet this FCC agent told our CE that he would have to wire around the shorted Austin transformer and get the tower lights working. Our CE told him that would result in a shorted tower and would badly distort the directional pattern. The agent told him we would have to get a special temporary authority to operate with parameters at variance and live with it until the new transformer arrived. Our CE nodded politely and the agent left.

Down the road a bit at our FM site, an agent, presumably the same one, showed up and noted the "No Trespassing" sign on the gate across the road (see photo). He must have been a law-abiding man, because he evidently turned around and left.

## Inconspicuous?

A few days later, the tower owner, RW contributor Charles Fitch, got a letter from the FCC in New York notifying him that he had violated Section 17.4(g): "The Antenna Structure Registration Number was not displayed in a conspicuous place so that it is readily visible near the base of the antenna structure."

Had the agent walked around the gate — which only restricts vehicular traffic; you can easily walk around it and down the gravel road a couple of hundred feet to the tower — he would have seen what is probably the world's biggest, most conspicuous tower registration sign, posted right on the gate at the tower base!

A round of letters went back and forth

## Engineers Struggle With Cueing Problems

► **WORKBENCH**, continued from page 23 at a whopping 5 VAC RMS (about 14 dBV), exceeding the supply of a unity gain 741 op amp in the Netcue box. Ergo, the formerly discrete Netcue FSK becomes many FSKs, and it is Dick's opinion that some of the many are also valid.

## Nominal levels

Ron Rollo at ABC has suggested that a nominal Netcue II/A input level is around 0 to -10 dBV. An "H" Pad based on 600 ohms ought to get it close, even though the Netcue input impedance is estimated at upwards of 10k ohms. Dick thought of putting a 1k trimmer pot as the center of the "H" Pad, to make it easy to find the "sweet" spot. Many broadcast Web sites offer resistor pad programs.

Dick also warns that because of the design sale to Starguide, no more 4595/Encore receivers are in produc-

tion, so supplies are now limited. If a station is making its living on a single Encore receiver, with no backup, you'd better get your GM to wake up. If a used or new replacement receiver is not in your budget, Dick suggests covering every orifice going into and out of the receiver with some really good transient suppressers. To neglect this need is like playing Russian Roulette with the station's income — especially when storm season approaches.

■■■

*John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.*

*Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or via e-mail at [jbisset@harris.com](mailto:jbisset@harris.com)*





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**MARKET WATCH**

## Twin Cities Favor Hometown Radio

**Tim Johnson**

Welcome to Minnesota radio, where homegrown personalities are favored, rock and roll rules and local radio talent takes on Howard Stern. But these issues are second to the most popular topic on the air — the weather.

reflect the misconception that we're all about weather. It's hard to shake this perception that weather, real and discussed, dominates life here.

"We'll always be a weather-fixated place," said Jim Pounds, media buyer at Periscope Marketing Communications in Minneapolis. "The importance ascribed to weather forecasting, reporting and

Paul and the surrounding suburbs is a largely homogenous group aged 20s to 40s. These listeners are reflected in the area's heavy concentration of rock and

pop stations and a lack of ethnic or urban stations.

People tend to stick around. The Twin Cities unchanging population is due, in part, to — what else — the weather.

Some argue that the reason most Minnesotans stay is that if you get through a winter with all your fingers and

See MARKETWATCH, page 43 ▶



Minneapolis at Night

Dispelling nasty stereotypes has kept Minnesotans busy ever since the movie "Fargo." The truth is, they don't use the

emergency this or that is all so unique to this place. We're absolutely preoccupied with anything related to weather."



term "ya" as much as people think, nor are they ignorant of the real purpose of a wood chipper. And sports does include more than ice-fishing. But one attribution — the discussion of the weather — is hard to dispel.

Here in Minnesota, the airwaves

### Recent change

Unlike the weather, which can vary from heat wave to ice cave in the span of hours, the radio market in the Twin Cities had remained the same until recently.

"Minneapolis radio doesn't change much at all. There's very little change in personalities and ratings. It's very unique. People don't leave, formats don't change," said Gary Swartz, a consultant at the Minneapolis-based company Radio Consultants, Inc.

One important group among the 3 million or so residents of Minneapolis, St.

## KNX: 60 Years at Columbia Square

**Bob Rusk**

In this age of ownership changes, format changes and call letter changes, it is reassuring to know that some things stay the same.

Much, in fact, has stayed the same at KNX(AM) in Los Angeles, which has had the same format — and general manager — for the past 30 years. The news director, who worked his way up through the ranks, has been at the station for the same length of time as the manager.

Perhaps more remarkable, this CBS-owned station has been in the same building for 60 years. The facility, known as Columbia Square, covers an entire block on Sunset Boulevard.

The location of Columbia Square, between Gower and El Centro Streets, is where the Hollywood motion picture industry was born.

In 1911, producer Al Christie rented a tavern and barn on the site and began making silent movies there.

In the 1930s, after CBS bought KNX, ground was broken on the site for a new \$1.75 million broadcast center of offices, studios and theaters to house the growing West Coast operations of the network.

CBS founder and chairman William S. Paley officiated when Columbia

Square was dedicated in an all-day ceremony on April 30, 1938. Some of the biggest names in Hollywood showed up, including matinee idol Clark Gable and funnyman Bob Hope, who was just beginning his association



KNX General Manager  
George Nicholaw

with rival NBC.

It was from there that many of the most popular radio shows of the 1930s.

See KNX, page 40 ▶

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# Steve Allen Made 'em Laugh at KNX

**Bob Rusk**

Steve Allen, it has been said, does so many things that he is the only person whose phone number is listed on every one of the Yellow Pages.

That's not much of an exaggeration. He has an impressive list of accomplishments. Allen created and was the original host of the "Tonight" show, which debuted on NBC-TV in 1954. He gained fame as a movie star two years later, playing the title role in "The Benny Goodman Story." In his spare time, Allen has written about 7,000 songs, including such evergreens as the theme from the motion picture "Picnic."

A look at this Renaissance man's résumé turns up another interesting item: It was 50 years ago that Allen began a late-night radio program on CBS station KNX(AM), which quickly attracted a standing-room-only audience to the studio and kept listeners at home up until midnight.

Allen had been hired, he recalls, to do a "chatter-and-records program." He immediately realized, however, that while following the format would promote the songs of the day, it would do little to further his career as a comedian.

Allen decided, without asking the program director, to play fewer records and instead deliver a joke-filled monologue.

Allen called the program "Breaking All Records," because he liked to smash the 78s. That got more laughs

than playing them did.

As might have been expected, the program director took a dim view of this. But listener reaction was so favorable that the PD allowed Allen to break the



Allen at KNX in 1948

format as well. His air time was doubled from 30 minutes to an hour. Despite such popularity, however, the program was never picked up by the network and was heard only on KNX.

**Hi-ho, Steverino!**

When he started at KNX, Allen was just a 20-something babe-in-the-showbiz-woods with a natural sense of comedy.

He greeted his audience with such opening lines as, "Hello everybody. This is Steve Allen, the square from

Columbia, speaking to you from Columbia Square in Hollywood. ... We seem to have an unusually large crowd tonight. No more people are here tonight, but those who are, are larger! We have people in the rafters tonight. Very few in the seats, but we're very big up in the rafters!"

One night he brought an out-of-town newspaper to the studio and it became the butt of his jokes. "I couldn't seem to find a thing of interest in The New Orleans Times-Picayune," Allen said. "You realize, of course, that these are very picayune times, and it's sometimes a little difficult to come across something in a hurry!"

The show quickly caught the ears of big-name entertainers such as actress Ethel Barrymore, George Burns and Al Jolson, Allen recalled recently.

"I had no idea when I started doing the show that just about all of the giants who



Steve Allen

trial and error. When the show started, I was in one small room not much bigger than the average announcer's booth — about three feet by four feet.

"By the time we finished up the series, when I had to go to New York to do television for the network, we were in what on other nights was Jack Benny's studio. It seated about 800 people. So the show underwent a very profound evolution. It

## It was 50 years ago that Allen began a late-night radio program on CBS station KNX(AM) in Los Angeles.

lived in Los Angeles were regular listeners. It's probably just as well that I didn't know; it would have made me nervous," Allen, 76, said.

It wasn't long before Jolson, billed as the "World's Greatest Entertainer," came on the show to promote his 1949 movie "Jolson Sings Again."

**Training ground**

"I was at KNX for three years (1948, '49 and '50) and had the time of my life," Allen said. "If I'd had the money, I would have paid them. I learned a lot by

was a training ground, during which I tried out a lot of experimental things that later would come in handy when I got into television."

Once, out of desperation, Allen grabbed a microphone and wandered into the audience to interview people. He had to quickly find a way to fill time when actress Doris Day failed to show up for a scheduled appearance — someone had neglected to tell her about it.

Allen, who remembered being in "a moderate panic" at the time, immediately

See ALLEN, page 41 ▶

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Circle (14) On Reader Service Card

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**E**ventide's **BD500 Broadcast Delay** makes talk shows run smoother and sound better, for less. The BD500's multiple dump feature divides the delay time into several "slices" so you're still safely in delay even right after dumping an offensive remark. It's the hassle-free talk solution... even when air talent is working without a producer. No other delay offers Eventide's high quality patented catch-up technology for clean audio combined with fast catch-up. And it's the only delay with optional digital inputs and outputs for new all-digital studios. Yet the BD500 costs thousands less than our previous model. See how much easier talk shows can be with Eventide's 4th generation BD500 Broadcast Delay.

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advertisers with better station-produced spots? An **Eventide Ultra-Harmonizer**® brand effects processor really does all that. Designed specifically for radio and production, the new DSP4000B Ultra-Harmonizer features radio effects designed by production whiz Jay Rose. Hundreds of comic voices, sound effects, reverbs, pitch changers and more are instantly accessible at the touch of a button. Plus, the DSP4000B has superb Timesqueeze® time compression /expansion capability. Shorten a 60 second national spot to allow for a local tag. Squeeze or stretch a music bed to fit the spot. The DSP4000B has optional digital I/O to interface easily with digital editors and consoles. It's the radio effects box designed to bring stations more business and more listeners.

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# BOTTOM



# LINE



# BROADCASTING



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# RAB '99 Aims to Rev Up Sales

Laurie Cebula

The Radio Advertising Bureau convenes its Annual Marketing Leadership Conference early next month.

Effective sales and marketing plans are the overall focus of RAB '99, opening Feb. 4 and running through Feb. 7 at the Hyatt Regency Hotel in Atlanta. The organization is offering sessions on business leadership, market research, creativity management, advertising and Internet marketing in workshops, demonstrations and exhibits.

Approximately 40 exhibitors are registered, and RAB '99 officials anticipate

2,500 attendees. Last year's convention in Dallas drew 2,200.

Keynote speakers include Elizabeth Dole, Dick Orkin, Dr. Gerald Bell, Harry Beckwith, The Dolans, Dr. Sean Joyce, Chuck Straley and Wallace & Washburn.

Special features include a consultant showcase day, a first-timers orientation, small-market sessions and a new workshop on BMI licensing for Internet radio.

#### Net fees

Show Coordinator Wayne Cornils and RAB Vice President of Communications Dave Casper said BMI licensing repre-

sentatives will present a new policy to collect fees for music played on radio station Web sites.

"We knew it was too good to be true," Cornils said. "This free stuff wasn't going to last forever. For radio stations playing music on their Web sites, BMI is here to say, 'We have a contract for you. You can't do this for free.'"

The RAB '99 committee has decided to add a new workshop to the agenda to help managers adapt to the new licensing. As Cornils put it, "You may not like it folks, but you have to know about it."

RAB also will debut "Internet Radio 2000 Exposition: Revenue Streams for



the Future." The expo features workshops and displays of methods and tools to promote your station and achieve the potential value of a Web site.

Cornils said, "Radio can not only sell their station and their merchandise, radio can sell their client's merchandise. Too many stations have Web sites or home pages but no idea of how to market it," he said.

Cornils likened the reluctance of radio

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**RAB expects  
40 exhibitors and  
2,500 attendees at  
the conference.**

executives to invest in the new frontier of Internet radio to a time when FM was new territory.

"We put that FM station on the air and thought, 'Now what? Nobody listens to FM, advertisers are on AM. Why am I spending this money?'"

He said the need to address the market potential of Internet radio is great. "It's coming, folks, and fast. If you don't do it, someone else will," Cornils said.

Several new companies related to the business of e-commerce and Internet radio are registered exhibitors for RAB '99.

#### Group discounts

It pays to bring a crowd to RAB '99. Registration fees are discounted per person when an organization sends a large group to the conference. RAB also provides such groups with a free meeting room.

"We have representatives from 26 different group owners registered this year, so the basic support is excellent," Cornils said.

Jacor Communications is sending 120 people to RAB '99, the largest single registration package from a radio group thus far. Its plan is to take advantage of the conference by holding corporate meetings during the convention, thereby stretching the value of travel and lodging expenses necessary in bringing company department heads together.

#### Basic fees

Registration fees are \$595 for members and \$995 for non-members. General managers pay half-price when their sales manager or staff are registered at regular cost.

Register or obtain more information by calling Gail Steffens at (800) 917-4269, or go online at RAB's Web site at [www.rab.com](http://www.rab.com)



# Dole, Beckwith Keynote RAB '99

**Laurie Cebula**

RAB '99 in Atlanta features a speaker that the Radio Advertising Bureau has long coveted. Elizabeth Dole is the scheduled keynote speaker at the Leadership Luncheon on Feb. 5.

"We have been trying to get her on our agenda for four years," Show Coordinator Wayne Cornils said. "We are very excited that she is included in our program this year."

Dole is making headlines as a possible presidential candidate. She resigned this month as president of the American Red Cross, a post she had held since 1991. Speculation that she might seek the Republican nomination immediately ensued.



Elizabeth Dole

Dole has served in government roles from 1971 to 1989 under five presidents. Her positions have included deputy assistant to President Nixon, secretary of labor under President Bush, secretary of transportation, Federal Trade Commission member and public liaison assistant to President Reagan.

Dole is a Phi Beta Kappa member and a graduate of Duke University. She holds a master's degree in education and government from Harvard and a degree from Harvard Law School.

Might Elizabeth Dole run for president? Among those touting the possibility is her husband, former Sen. Bob Dole. An online publication reported that when asked about his wife's political aspirations, he said, "I think it's fair to say that she's looking at it. In my view, she'd be an outstanding candidate. I'll admit I'm totally biased and prejudiced."

**Marketing expertise**

Marketing specialist and acclaimed author Harry Beckwith will deliver the opening keynote address at RAB '99. The keynote, which shares the title of Beckwith's recently published book "Selling the Invisible," will be delivered following the breakfast opening ceremony, 7:30 a.m., at show headquarters at the Hyatt Regency Hotel.

Founder of Beckwith Advertising and Marketing based in Minneapolis, he has worked with such clients as McDonalds, Chase Manhattan Bank, and Shearson, Lehman and Hutton. He is considered a specialist in media relations, communications and marketing, according to the RAB.

Beckwith's "Selling the Invisible: A Field Guide to Modern Marketing," published by Warner books, is described by American Library Association critic

Barbara Johnson as "a very human, much-needed book to savor and be refreshed by." Critical praise for Beckwith's book is plentiful. He is noted for a down-to-earth approach and ability to provide quick, practical strategies.

Beckwith is touted as a pioneer in modern marketing methods. In his book, he writes that the problem in traditional marketing is that it is product-oriented rather than service-oriented.

Beckwith said his keynote remarks will deal with emotions. He said purchases ultimately are not driven by rational thinking but by emotional factors. He said radio sales people must also be aware of stereotypes.

"How do they see you before you even enter the door? If you're not aware of what they are and don't absolutely attack the stereotype from the get-go, you're simply not going to make the sale," he said.

Beckwith said he will discuss the importance of storytelling in radio sales. He said stories help listeners understand a business and products, and distinguish them from others.

**Sales culture**

Another featured speaker is Dick Orkin. Orkin's Radio Ranch, an advertising service that provides 30- and 60-second spots described as "mini-dramas" by the



Harry Beckwith

Radio Advertising Bureau, has earned awards and a reputation for success in the advertising industry. Newsweek See KEYNOTE, page 32 ▶

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# Keynoters Speak at RAB '99

► KEYNOTE, continued from page 31  
magazine called him "the established master of the advertising theater of the absurd."

Orkin will host the forum "A Sales Marketing Method for Changing Radio's Sales Culture." The Saturday-morning forum is an opportunity for radio broadcasters to receive an evaluation and analysis of themselves, their products and the ways in which they plan and execute client and agency calls. Orkin will be joined by Radio Ranch staff writer Christine Coyle and radio sales trainer and consultant Jim Taszarek.

Orkin's latest project "Between the



Dick Orkin

Words" is an online class offered three times a year and limited to 10 students per six-week class period. During the course, students work on three script projects from beginning to pre-production.

Orkin's unconventional creative process aims to coach radio writers toward accessing their roots memories and experiences that are unique to their individual nature. This appreciation of what Orkin refers to as "you-ness" makes it possible for a writer to create a distinct, powerful writing style, according to the Orkin philosophy.

For more information, visit the Dick Orkin Radio Ranch at [www.radio-ranch.com](http://www.radio-ranch.com)

## PROMO POWER

# Discount Cards Revived

Mark Lapidus

"The Frequent Listener Card," "The Loyal Listener Card" and "The Discount Card" are popular names for the plastic discount cards that have been used by radio stations for years. Much has changed to make this program of attracting listeners through discount cards more attractive and effective.

Slowly, but surely, the radio listener card has evolved from mainly a sales tool to a device used to reward listeners for their loyalty and participation. Of course, there have been many technical advances in the making of a "smart" card. But one technical trend in particular has made it easier than ever to reach the correct end-user effectively — the natural tie between the station card and a radio station Web site.

Prior to the wonders of the Web, stations had to invest much more effort and money into the card start-up process. This began with soliciting interest from listeners on-air and usually asking them to call a telephone number for more information and registration, or telling them to go to a limited number of client locations. The telephone number had to be connected to a voice-mail system or be staffed by live operators.

If a station went with the client location concept, they were limited to the clientele of that chain. In either case, the registration information then had to be transcribed and manually entered into a crude database. With the advent of Web sites, the main solicitation can happen on-line with the requested data being entered into software which allows for automatic and easy manipulation.

### Multiple benefits

Further, once the participant information — name, address, phone number, e-mail address, age, gender, fax number — is gathered and sent to the card manufacturer, participants can be notified of benefits and directed toward client locations by the very device that enabled them to apply for the card: your Web site.

Card-holders can even be notified by e-mail. If you like the e-mail notification concept, be sure to ask your audience if they would like to receive information in this manner or you may be accused of spamming.

Web promotion of the card is tremendous. It permits stations to show several card benefits at once, cleans up on-air clutter and shows potential participants why they should want the card. This situation is certainly more attractive than the days when stations that wished to start a card program would use direct-mail solicitation or massive

See PROMO, page 33 ►

## Confiability with Life Time Warranty

### EDUCATIONAL CIRCULAR SERIES

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MP-1	1	600W	-3.3	\$250
MP-2	2	800W	0	\$680
MP-3	3	800W	1.4	\$980
MP-4	4	800W	3.3	\$1,280
MP-2-4	4	2,000W	3.3	\$1,820
MP-3-5	5	3,000W	4.1	\$2,270
MP-3-6	6	3,000W	5.2	\$2,740

### LOW POWER CIRCULAR SERIES

Model	Bays	Power	Gain	Price
GP-1	1	2,000W	-3.1	\$350
GP-2	2	4,000W	0	\$1,350
GP-3	3	6,000W	1.5	\$1,900
GP-4	4	6,000W	3.4	\$2,600
GP-5	5	6,000W	4.3	\$3,150
GP-6	6	6,000W	5.5	\$3,700

### MEDIUM POWER CIRCULAR SERIES

Model	Bays	Power	Gain	Price
SGP-1	1	4,000W	-3.3	\$690
SGP-2	2	8,000W	0	\$2,690
SGP-3	3	10,000W	1.4	\$3,595
SGP-4	4	10,000W	3.3	\$4,500
SGP-5	5	10,000W	4.1	\$5,300
SGP-6	6	10,000W	5.2	\$6,100

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► PROMO, continued from page 32

card drops as inserts in daily newspapers. At that time, stations would also have to take up a lot of airtime to cover multiple benefits.

Even though Web technology has made the start-up process easier and maintenance simpler, common card mistakes still flourish. The major problem is lack of consistent tangible listener benefit. Ironically, sometimes this doesn't surface until after the card has finally become established.

It's easy for promotion departments to tire of the effort required to solicit benefits and for sales departments to move on to selling the next package. Don't let it get to the point where listeners call you to complain about the card being useless!

**Common mistakes**

The second typical problem is lack of significant benefit, which makes it seem to client and listener alike that the card and the station are failures. For example, if you tell listeners they can get ten percent off a restaurant meal, it won't be enough of a savings to drive traffic. Then, when the traffic isn't forthcoming, your client won't blame himself for being cheap on his discount; he'll blame your station for having no listeners! Getting 50 percent off a meal, on the other hand, is more like it and you and your client will see some action. The third mistake is lack of communication with the database.

It's vital that a station plan on doing a mass mail or e-mail a few times a year to the whole list to thank them for using the card and to inform users of the latest savings.

A fourth common mistake is not scrubbing the database a few times a year, weeding out those who have moved or no longer wish to use the card. Sometimes this is as simple as deleting club members when a mailing comes back to the station due to a move.

I briefly mentioned smart cards offered by many vendors. Special strips or a bar code embedded on the card permit you to track usage down to the person. Naturally, these cards are more expensive and require a device that reads the card on the client end. Smart cards are terrific but do require greater resources.

If I've awakened your interest in creating a listener card, allow me to suggest shopping for vendors carefully, even checking outside the usual radio industry suppliers. I also urge you to check registered service marks before printing tens of thousands of cards.

There is one problem which probably can't be overcome. The card does take space in a wallet. If your wallet is like mine, it resembles George Costanza's in the infamous "Seinfeld" wallet episode. When wallets get that big, even a card with plenty of benefits could get lost. Fortunately, with the Web, replacement is only a few clicks away!



Mark Lapidus is president of Lapidus Media, a programming and marketing consultation firm. Contact him via e-mail at lapidus@erols.com

**RADIO REVENUE : YEAR TO DATE**

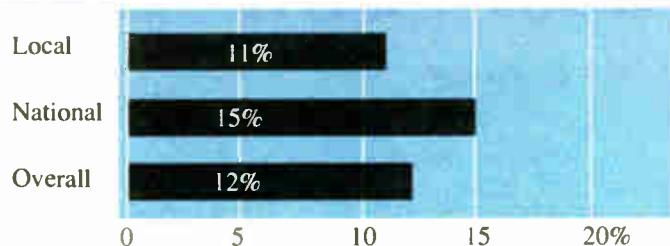
**Revenue Increases Roll On**

It was another year of double-digit revenue increases for radio. The Radio Advertising Bureau said 1998 marked more than six years of continued, unprecedented growth in revenue.

Monthly and year-to-date revenue totals were up in all sections of the country through November, according to the RAB radio revenue index of more than 100 markets. RAB President and CEO Gary Fries predicted a 12-percent overall increase for the year.

National revenue was up 15 percent, and local advertising climbed 11 percent, when measured against the first 11 months of 1997.

Local and national revenue combined was up 12 percent in all markets in that period. For the month of November alone, total revenue increased 11 percent.



November 1998 marked 75 consecutive months of sales growth in the radio industry.

The Southeastern region led national revenue increases, with a 19 percent hike through November. But in that month alone, the Eastern region was strongest, gaining 20 percent.

Revenue figures are based on more than 100 markets, as reported by the accounting firms of Miller, Kaplan, Arase & Co. and Hungerford, Aldrin, Nichols and Carter.

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# Jacor Aims AAA in Affluent L.A.

Sandy Wells

Back when adult album alternative station KSCA(FM) in Los Angeles was breaking artists such as Paula Cole, Ben Folds Five and Hootie and the Blowfish, it was the darling of Hollywood's media elite, and many yuppies embraced it as the revival of the progressive FM rock radio.

Yet it struggled to crack a 2 share. Some people were thinking, "It's the signal, stupid!" That, at least, is part of the official reasoning behind the decision by Jacor Communications to pursue the format on the even weaker combined signals of KACD(FM) Santa Monica and KBCD(FM) Newport Beach at 103.1 MHz.

"We saw an opportunity with the geography matching the audience," said KIIS-FM General Manager Roy Laughlin. "We're going to maximize the signal where the upscale Anglo audience is. It's the No. 1 format for them. 101.9 did not do well in the Westside, but is strong in the high-density Latino areas, which is why it went to No. 1."

There's no denying that the performance of KSCA under the management of Heftel Communications has been impressive. Within weeks of its debut in February 1997, the new Mexican Regional format — "La Nueve" — rocketed into the top 10. In the summer 1998 Arbitron audience estimates, morning

man Renan Coello ranked No. 1 among persons 12+ with a giant 9.1 share.

But triple A in Los Angeles was not really killed by low ratings in the first place. Golden West Broadcasting wanted to sell the station, and owner Gene Autry was eager to liquidate the last of his broadcast properties. (Technically, Golden West is still the licensee, but Heftel will probably exercise its option to buy the station in the near future.)

It is arguable that a full-market commercial station such as KSCA is not the most appropriate vehicle for triple A. Since the demise of the format on 101.9, it has had a new life on public radio, as KCRW(FM) and KPCC(FM) have

sought to capture KSCA's devotees.

A tribute Web site, "The Yellow Room," provided some solace for these disenfranchised listeners. "Channel 103.1" came on the air at 5 p.m. of Oct. 19 last year.

Jacor's press release promised a world-class rock format that would "remind many of the similarly formatted KSCA prior to its switch to Spanish-language programming." Although not a "full-market" station, the combined signals of KACD and KBCD provide good coverage of most of the L.A. basin. It reaches into the canyons better than most of the big FM stations, but it fades to white noise in the populous San Fernando and San Gabriel Valleys.

Former Music Director Nicole Sandler also served as music director and air talent for the old KSCA. For her, it's a matter of trading a weak full-market signal for one that has some advantages.

"We knew we had a signal problem at 101.9," she said. "The 103.1 signal is really strong where we need to be. We have an upscale audience that isn't being served." But was KSCA's 4.8 kW signal really too weak to reach its target audience? Technically, 101.9 has what it takes.

"101.9 is capable of generating ratings. It can be heard just about everywhere," said Greg Strickland, chief engineer for Heftel's Los Angeles radio stations. "KSCA broadcasts from Mt. Wilson, which is the same location that all the major radio stations broadcast from. The 101.9 signal is substantially similar to the signal of all the major L.A. FMs.

"For instance, you can't hear the other major FMs in Malibu very well, because of the nuances of the terrain. (But) you can hear 103.1 (KACD) there. Every station that broadcasts from Mt. Wilson is stronger in East L.A. than in Malibu."

## Pitching triple A

Although Laughlin denies it, Jacor had another motivation to launch the triple A format on 103.1. Groove was a thorn in the side of its CHR giant KIIS-FM 102.7, home of Rick Dees. The proximity of the two signals — they were neighbors on the dial — and the similarity of the formats created a situation that begged for a solution.

"KIIS was our No. 1 for sharing cume," said former Groove Operations Manager Manon Hennessey. "Two top sales people at KIIS wanted us bad. They pitched Jacor higher-ups on triple A and Nicole Sandler."

In 1996, owner Ken Roberts was unhappy with the performance of KACD/KBCD. A decade before, he had created the "World Famous KROQ" and sold it to Infinity for a handsome profit. KACD/KBCD, on the other hand, was barely registering in the ratings with its innocuous mainstream adult contemporary mix. (Before that, he had made a go of it with an innovative smooth jazz format.)

He decided to launch "Groove Radio" on 103.1. The format was the creation of Egil Aalvik, known on the air as "Swedish Eagle," and it featured a heavy dose of "House Music," a sort of hardcore disco music popular in Europe and in some clubs around the states. Although that novel mix attracted a steadfast following among Hispanics, gays and young "clubbers," it was a little too eclectic to win a substantial audience.

After a year, Aalvik was ousted and his trademark "Groove Radio" moniker simplified to "Groove 103.1" It was then

See AAA, page 36 ▶

# Get Better Jocks for Less Money

Increase profits by running your station more efficiently. Outside the highest billing hours, it doesn't make sense to pay announcers to sit around *waiting* to talk. A Scott uncompressed music on hard drive System can put all the songs, spots and prerecorded Voice Trax together smoothly with *nobody* in the air studio!

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After the station's music has been scheduled, one touch of a button automatically e-mails the log and the latest live copy to the distant announcer. Scott's VTVI works seamlessly with all music schedulers and traffic/billing programs.

Scott's Voice Trax Via Internet software is *very* easy for your announcers to use. Scheduled live tags, trivia and copy display automatically on the right side of the screen. There's no fumbling with a copy book or even a mouse. When you're recording a song ending, simply press the space bar on the VTVI keyboard to start the next song or spot. Release the space bar after you stop talking. VTVI then moves ahead to the next place to talk.

All Voice Trax are recorded with the computer's ordinary sound card with impressive digital fidelity. Depending on your format, a microphone processor may be helpful to punch up the announcer's voice, but no console is needed.

If all the station's spots have been produced when the log is sent, Scott's Voice Trax software automatically computes and displays accurate time checks the announcer can include if desired in any Voice Trax.

After recording, any or all of the show can be reviewed and changed. Scott's VTVI Segue Editor even lets your jock fine-tune timing without any need to re-record any thing.

When done, a click on the VTVI Auto-Send button dials the Internet and moves the entire show to the distant Scott digital audio system automatically. Transfer speeds vary based on your Internet Service Provider, but with a dial-up phone line a shift can upload to the Internet in 40-50



Here's Scott's Voice Trax Via Internet (VTVI) software, shown with the optional Segue Editor. VTVI allows a distant announcer to pre-record a 4 hour show in about 15-20 minutes with nothing more than a Windows computer, an Internet connection and a good microphone.

minutes. With ISDN, transfer time can be 20-25 minutes.

Your announcer can be answering e-mail, writing copy, editing promos or doing a number of other things on the VTVI computer while your show is being transferred.

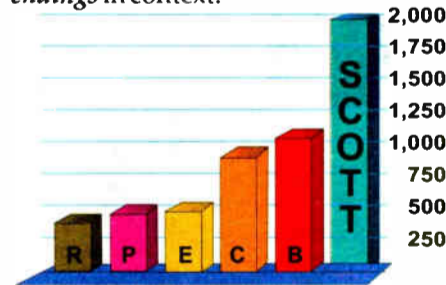
Scott Studios VTVI also includes our exclusive Voice/Music Synchronizer. When any Voice Trax mentions song titles or artists, your jock turns on the link so the Trax plays only with the correct song. No operator attention is needed at the station for Voice Trax to play seamlessly. If the announcer forgets to record something, or songs or spots get changed at the last minute the Scott Voice/Music Synchronizer automatically substitutes generic Voice Trax for each day and hour for each announcer.

Nothing could be easier or less expensive, yet still sound so good as good talent with Scott's VTVI! Of course, the free Voice Trax Via Internet does require Internet connections on both ends, a \$29 per month FTP transfer site, and the Scott NT System plus a \$2,500 Scott Remote Recording Router back at the station.

We also offer a \$500 VTVI Deluxe that lets the announcer download telescoped song intros and endings from the Internet, then fine-tune timing of talk-ups and backells in the context of the music and spots with little or no need for re-recording. With the VTVI Deluxe, a telescoped aircheck can be previewed with the beginnings and

ends of the songs and spots.

Or, the \$1,000 Super Deluxe VTVI lets your distant announcers record *while listening to song and spot intros and endings* in context!

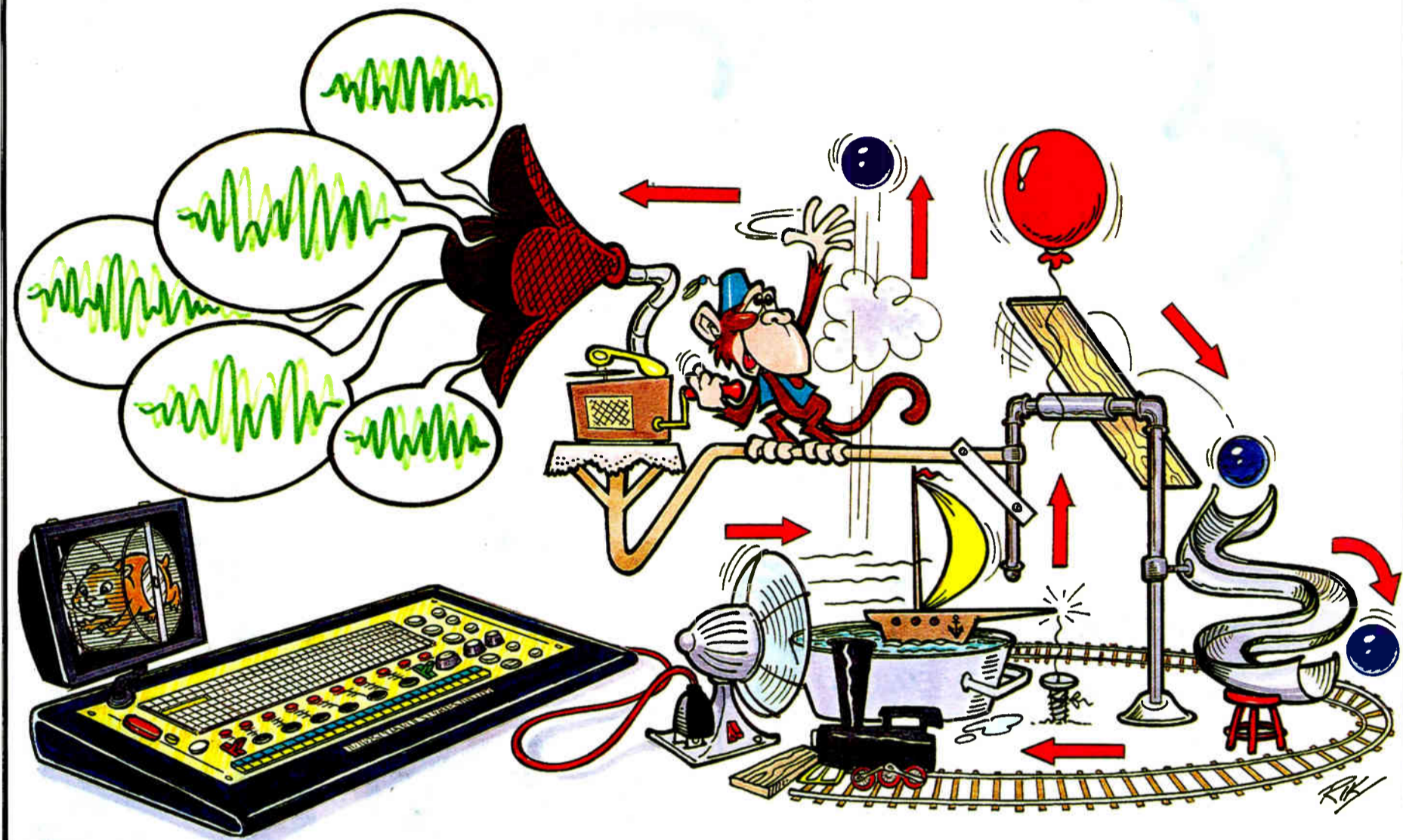


It's a fact: More U.S. stations use Scott Studios than *any* other major digital audio system. 1,950 radio stations have 4,300 Scott digital work-stations, including *major* groups like CBS, Chancellor, Disney/ABC, Clear Channel, Emmis, Citadel and many more. In the US' top 10 markets, 45 stations and 5 networks use 155 of our digital workstations

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Circle 166 On Reader Service Card

# Geography and Radio Destiny

▶ AAA, continued from page 34 that, Henessey, who had been with the station for 13 years both on the air and as program director, took over.

She continued to develop its edgy, ahead-of-the-curve identity among devotees of the music. Groove gained a national reputation. "The labels would tell us that rhythmic CHR's around the country would ask them 'What's Groove doing?' We were the dance music leader. When it came to the industry, they sold a lot of music due to us. They're going to feel it."

Although a boutique format, Groove was beginning to taste success when Jacor made Roberts an offer he couldn't turn down. "We're doing some of the best things in the history of the frequency," Henessey said. "We did adult contemporary for upscale whites for 15 years. It didn't work. There was too much competition."

### Far out playlists

Will triple A work better this time around in Los Angeles? Dave Benson from Jacor's Denver-based, highly successful triple A station, KBCO-FM, is heading up the transition as program director and Sandler believes the mistakes of the past can be corrected with better results this time.

The music, Sandler said, "will be a little more focused, a little tighter. There won't be so many 'out there' cuts. But I will still be eclectic." Back in the beginning of the triple A KSCA, evening personality Mimi Chen hinted that maybe the playlist at that time was a little too "out there."

"When the DJs like listening to the station where they work, that means the station plays too much new music," she said.

Working at another part of the Jacor establishment, Mike Thompson programs sports talk KXTA(AM). He recalls his triumph in Dallas with KTCK(AM), a station that earned respectable ratings despite a very weak signal north of the city.

"With channel 103.1, they are just like the sports fan," Thompson said. "They may not be a large audience but they are dedicated. Their cume may be small, but the amount of time they spend with the station is mammoth." Changes in survey methodology may help the coastal franchise. Beginning with the fall '98 book, Arbitron formally divided Los Angeles into six different areas.

"County splits is a 30-year-old technology," said Arbitron Vice President of Communications Tom Mocarsky. "All we're doing is giving a little more quali-

ty-control check, a little more assurance that we're paying attention."

To Groove's Henessey, it's a little too late. Arbitron's diary placement often left the little Santa Monica station out in the cold. "If diaries landed in the San Fernando Valley, we were screwed," Henessey said. "Over the years, the sampling of the diary was really difficult for us."

Mocarsky said it is unlikely that county splits will alter the ratings picture. "The ad agencies will find it easi-

er to correlate station performance according to geographic area," he said. "The distribution will be a little more uniform."

It is often said that on the Internet, content is king. One would assume the same may be said of broadcasting. In this case, Jacor may have found the right signal for the right audience. Perhaps, for a radio station, "geography is destiny."



Sandy Wells is a news anchor for Metro Networks in the Los Angeles area and writes for San Gabriel Valley Newspaper Group and the L.A. Radio Guide. Reach him via e-mail at sandywells@prodigy.net



### Rodman Joins PR&E

Pacific Research and Engineering Corp. has announced the appointment of Tracy Rodman to the position of



Tracy Rodman

communications manager.

In her new position, Rodman is in charge of handling media interface, promotion, public relations activity and communications for PR&E.

Rodman previously served as public relations specialist and media liaison for Broadcast Electronics Inc.

### TFT Promotes Piatte

TFT, Inc. has announced the promotion of Jesse J. Piatte Jr. to the position of vice president of sales —U.S. markets, for its radio and television broadcast product lines.



Jesse J. Piatte, Jr.

Piatte's new responsibilities include leadership for all of TFT's domestic sales force development, training and execution activities.

Piatte previously served in customer sales and service positions at TFT.

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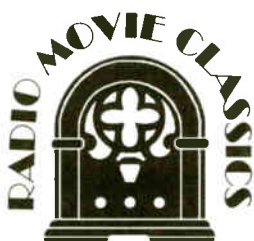
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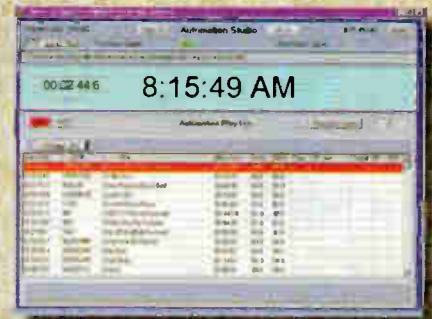
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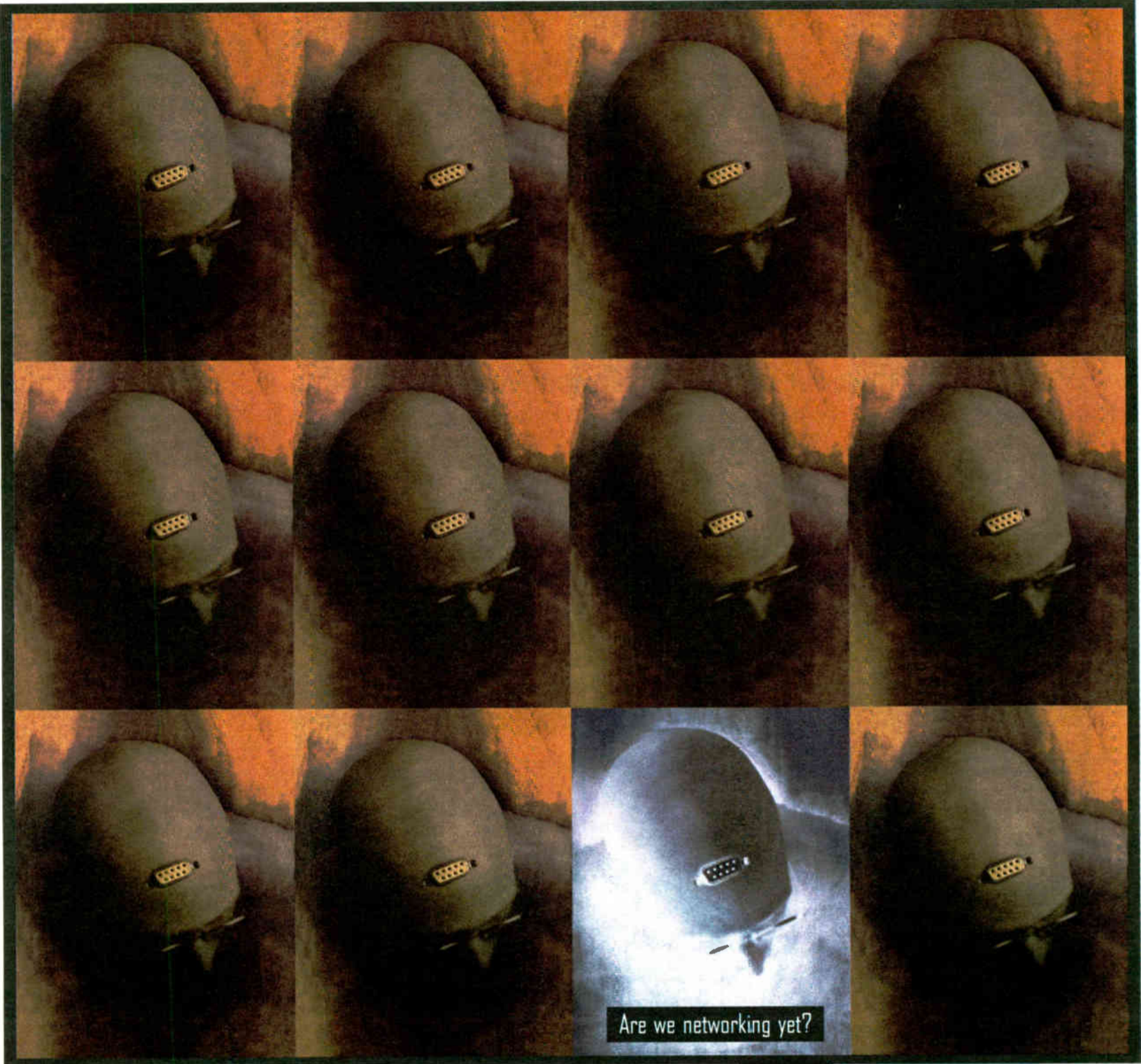
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ONLINE RADIO

# Making Money on the Web Yet?

**Kim Komando**

Suppose you have your Web site up-and-running. You have live audio feeds. You have the contests. You have the multimedia capabilities. You've employed every Internet technology under the sun. Now there's just one thing missing — revenue. With all that activity and all that interest, you would think there would be a way to turn your Web site into an income-producing center. Actually, you're right — there are services available to help you make money on the Net.

Before I get into the "how-to" part, let me offer a word of warning: There is money to be made on the Internet, but not overnight.

With that said, there are a few ways to generate some income from your Web site. If you've ever visited a popular portal site like NetCenter ([www.netcenter.com](http://www.netcenter.com)) or AltaVista ([www.altavista.com](http://www.altavista.com)), maybe you've wondered if there's any money to be made selling advertising banner space on your Web site. The answer is yes — if you have the incredibly huge amount of traffic that these sites do.

Sites that sell banner advertising base their rates on the number of impressions they display in a particular month. For example, you might pay to have 100,000 impressions of your banner ad displayed on Lycos in any given month.

The reason these big sites can make any money at all with banner advertising is that they have millions of visitors each month.

In short, unless your radio station or program serves a very well-defined niche audience and your advertisers are tailored to that particular audience, you probably won't be able to charge enough for banner advertising to make it worthwhile.

**Follow the link**

As you surf the Web, you may find companies willing to pay you for banner advertising based on how many of your listeners actually follow the link to the advertiser's site. I've heard many more complaints about these outfits than I've heard compliments. My advice is to stay away. The most common way to make money in cyberspace, or anywhere else, is by selling something. However, selling effectively on the Web requires quite an intricate infrastructure. Fortunately, you don't need your own infrastructure; you can rent someone else's.

Perhaps the easiest way to get into online selling is by becoming an affiliate of one of the two major online booksellers, those being Amazon Books ([www.amazon.com](http://www.amazon.com)) and Barnes & Noble ([www.barnesandnoble.com](http://www.barnesandnoble.com)). Both companies offer programs that work pretty much the same. You're provided with some special coding to add to links leading to these sites. Then when a listener follows the link and buys something, your station gets a commission.

In the past, this didn't represent much of an opportunity for radio stations or programs. After all, radio listeners aren't neces-

sarily huge book buyers. However, in recent months, both Barnes & Noble and Amazon Books have started selling music CDs, video tapes and DVD disks, as well. These items can fit in quite nicely with a radio station's or a radio program's particular personality.

For example, you could have a featured artist or author each week. During the time that artist or author is highlighted on air, that artists' entire catalog is available for easy purchase through your Web site. Under either of these programs, all you do is provide the link. The selling company handles all the transactions, keeps all the records, ships the goods and sends you commission checks at regular intervals.

An arrangement like this doesn't help much if you have your own goods that you want to sell. On the other hand, setting up an e-commerce site from scratch can be a daunting and expensive task. Fortunately, many of the so-called portal sites are making it easier than ever to get into e-commerce.

For example, Yahoo! ([www.yahoo.com](http://www.yahoo.com)) now offers a service called Yahoo! Store. Using this service, you can set up your own online storefront working entirely within your normal Web browser. Customers can then order your merchandise online. At your convenience, you can then retrieve those orders through a secure, encrypted connection. The current cost is

only \$100 per month with no setup fee.

One word of caution, though: Don't expect a fully automated e-commerce solution for this kind of money. What you'll get from Yahoo! Store is a text-based order that you'll then have to process manually through whatever means you see fit.

If you really want to go hog-wild with e-commerce and your Website in general, you may want to consider employing the services of a Web developer/host that specializes in radio stations such as OnRadio ([www.onradio.com](http://www.onradio.com)). In addition to complete Web site design, this outfit offers a number of ways to generate income.

Remember earlier when I said banner advertising probably isn't worth the effort? Well, OnRadio makes it worthwhile by selling banner advertising on behalf of its radio clients. Your station carries the ads along with all other OnRadio clients, so you get a slice of income generated by the ads. Plus, OnRadio keeps all the records for you.

The company offers more services to enhance your Web site. To get the full scoop, recommend you visit the OnRadio Web site. The Internet is a relatively new retail medium. You're not likely to strike it rich online soon. The key is gradually getting your listeners to think of you for their e-commerce needs. The next step is building brand loyalty. The information may flow at light speed but you have to invest the time and effort before you'll really see the cash start to flow.



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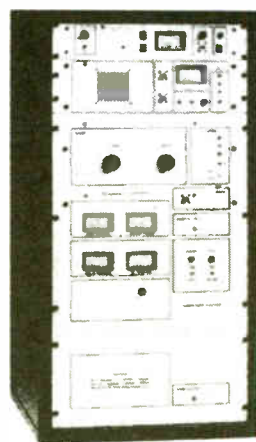
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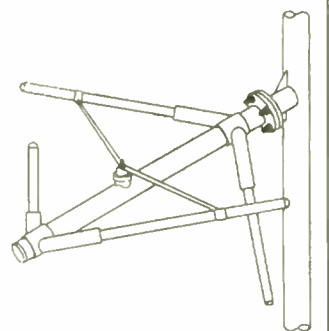
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# Columbia Square in 1938

► KNX, continued from page 27

'40s, and '50s originated.

Each night, long lines of fans would crowd into the forecourt of Columbia Square, waiting to attend the broadcasts.

The schedule was dominated by such winners in the Hooper ratings as "The Jack Benny Program," "The George Burns and Gracie Allen Show" and "The Edgar Bergen and Charlie McCarthy Show."

In 1944 Art Linkletter moved into Columbia Square to begin hosting "House Party," an audience participation show. The network, which ran first on radio, then on television, posted a 25-year run. For the most part, the show was done live.

"Getting a studio audience was the big

hang-up," Linkletter said.

"We had to have one, so we bribed the ushers to go out on Sunset Boulevard and shanghai any passers-by," he told *RW*.

In the 1950s, when the networks began to focus their attention on television programming, stations were left to fend for themselves. KNX ultimately found its niche with a format that included "a little bit of everything," said Vice President and General Manager George Nicholaw.

In the ensuing years, there was a mix of news, music and a lineup of air personalities on KNX that included morning man Bob Crane, who would go on to star in the CBS TV series "Hogan's Heroes."

Nicholaw, who had worked in com-

munity services and programming at CBS TV stations, came to KNX in 1967 to oversee operations during the station transition to a news format the following year.

## One million listeners

Today, as the top-rated news station in Los Angeles, KNX consistently attracts about 1 million listeners a week. In the Summer '98 Arbitron book — with summer generally the weakest book for the station — KNX scored a 2.1 share among 12+ listeners, and a 928,000 cume.

In the key 25-54 demographic, KNX received a 1.6 share and a 515,300 cume. The format competitor is all-news KFWB(AM). Though the competing sta-

of technical operations at the station.

Sietsema said the Associated Press Electronic News Production System (AP ENPS) is being evaluated to replace the NewStar system that KNX has used for the past 15 years.

The station also expects to phase out the use of analog tape, but for now it remains an integral part of the newsroom.

"We've had difficulty finding a (digital) system that will handle both the commercial audio and news audio in a manner consistent with the way we do things," Sietsema said.

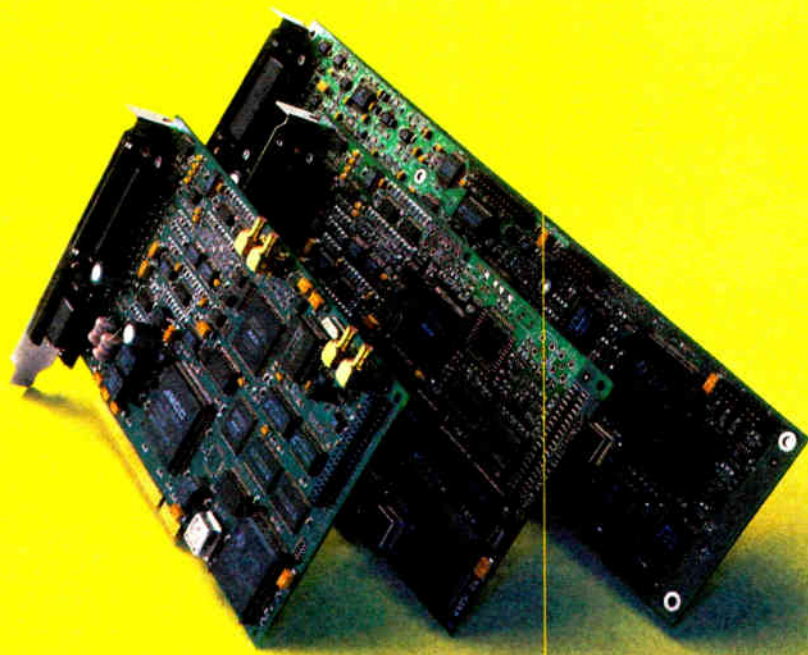
"I'd certainly love to get KNX off of analog tape, but I don't see it happening within the next year just because of the number of things we have going on



KNX Groundbreaking Ceremony at Columbia Square, 1938

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Circle (180) On Reader Service Card

World Radio History

tions share ownership. "The competition between the two stations for audience and all of the ways in which newsrooms compete are all still very much in place," said KNX News Director Robert Sims.

"As KNX enters the fourth decade as a news station, it remains committed to the format," Sims said. "In some cases," he said, "KNX devotes more air time than ever to breaking stories."

Sims said that with the possible exception of public radio, the time devoted to stories on KNX is "as long as you'll find anywhere."

In a move to strengthen its news position further and also address the Year 2000 issue, KNX is planning a facility upgrade, said Rick Sietsema, supervisor

simultaneously.

"We have nine different studio locations that record either commercials, news items, or both — in addition to all of the places where we record audio from reporters who call in from the field. It would be cost-prohibitive at this point to accommodate that many recording stations with digital systems." Once upgraded, KNX will be better equipped to compete with other stations and emerging media in the 21st century such as the Internet.

General Manager Nicholaw said, "Even though times are changing and there is greater competition ... the audience for news is there and will always be there. It's a format that people depend on."

## Heritage Station

The colorful history of the station that would become KNX dates to 1920, when Fred Christian, an ex-shipboard wireless operator, built a 5 W transmitter and went on the air with the call letters 6 ADZ.

The following year the station began operating as KGC on 360 meters (833 kc).

In 1922, powered by a new 30 W transmitter, the call letters were changed to KNX.

By the summer of 1922, nearly two dozen other stations in the area had been licensed to broadcast and they all shared the single wavelength of 360 meters.

An intense rivalry erupted over the shared air time, but KNX, with live broadcasts of a 60-piece orchestra from the California Theatre, was usually on the air in the prime hours of 7 to 10 p.m., three nights a week.

Out of those chaotic earliest days of Los Angeles AM radio, three stations survive: KFI, KKJH (originally KHJ) and KNX.

Along the way, KNX was awarded its own frequency — 1070 kHz — and boosted power four more times, finally to 50 kW in 1934.

The only thing the station did more often than that was move. Through the years, KNX has been located in a back bedroom in Christian's home, and, when the station was owned by Western Broadcasting Co., the Paramount Pictures lot. In 1936, CBS purchased the station from Western.

General Manager George Nicholaw said no documentation exists to verify why the KNX call letters were chosen. One theory is that KNX refers to an annex at the Spring Street Arcade, where the station was once located.

Now at Columbia Square, KNX shares space with classic rock KCBS-FM and KCBS-TV. While KNX is known foremost as a news station, it also airs old-time radio from the 1930s, '40s and '50s. The station runs classic shows every night, including such one-time CBS favorites as "Our Miss Brooks," "Gangbusters" and "The Whistler."

— Bob Rusk

# Steve Allen and a Career on the Air

▶ ALLEN, continued from page 28

discovered how funny people can be. "(That's) partly because they're nervous," he said. "I think if I talked to them on the street with my hands in my pockets, they wouldn't be that funny or nervous. But when they realize they're on the air, they often say goofy things.

"One night I was going up the right side of the aisle and happened to start three or four conversations in a row by saying, 'Hello. Where are you from?' And the guy would say 'Chicago, Illinois,' or 'Topeka, Kansas,' and we'd take it from there.

So then I said, 'Thank you, folks, now I'll step over to this side.' I said to a man sitting there, 'Hello, sir, what is your name?' and he said 'Boston, Mass.'

**Allen's radio career began when he dropped out of college in 1942 and worked part-time at KOY(AM).**

"That's funnier than any joke I could write. That kind of thing happened quite often."

On another night, a lady in the audience opened a small box and presented a gift to Allen. "Oh, this is a boutonniere," he said, then jokingly added, "I'll give you a boot in the ear, too!"

**Earliest days**

KNX was just one stop on Allen's climb up the broadcasting ladder. He began his radio career in Phoenix, when he dropped out of college in 1942 and took a part-time job at KOY(AM).

Allen worked at the station for a couple years and managed to save \$1,000, then quit and headed for the bright lights of Hollywood.

He landed a job at KFAC(AM), now WKW, and then teamed up with Wendell Noble, an announcer he had worked with at KOY. Noble, who had preceded Allen to Hollywood, was

working at Mutual network affiliate KHJ(AM), now KKHJ.

Allen and Noble created a comedy show called "Smile Time," which ran from 1946 to 1948 on Mutual. Among the characters played by Noble was a Mexican named Manuel Labor.

While using such a name on the air in the 1940s may not have been an issue, Allen said he wasn't sure that it would be acceptable in the 1990s. People "are going to both extremes" of political correctness today," he said. "There's a lot of stuff which is definitely in the poorest possible taste."

In his current book, "Dumbth," (Prometheus), Allen asserts that much of

commercial radio today is poor quality. He takes aim at the "Howard Sternization of American Radio."

**'Socially destructive' Stern**

Allen writes that Stern "has become enormously successful by the saddest possible means — he simply talks dirty."

"As a human being, I wish him the greatest of health," Allen said. "But I am sickened by what he does. I deplore it." Allen said he is particularly concerned about the effect that Stern's base comedy could have on children, and called Stern's show "socially destructive."

"We're sending children exactly the opposite message that we've been trying to teach them for 1,000 years, and that's dangerous," Allen said.

Despite such objections, he does remain a regular radio listener. Allen may land on his old stomping grounds, KNX, when he is twisting across the dial for a news update.

He also tunes in National Public Radio "or a public station of any kind" for music, he said.

"Sometimes I'm in the mood for classical, so I tune in that. More often, I'm in the mood for a jazz station."

It is clear that even though he's no longer behind a microphone, this legendary entertainer passionately cares about radio and still feels a strong connection to the business.

"I listen every day," Allen said.

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**Career Highlights**

Long before Steve Allen became a television star as the original host of the "Tonight" show, he had made quite a name for himself on radio. Following are the stations and networks at which he worked:

- 1942-44 KOY(AM), Phoenix
- 1944-46 KFAC(AM) and KMTR(AM), Los Angeles
- 1946-48 Mutual Radio Network, "Smile Time"
- 1948-50 KNX(AM), Los Angeles
- 1949-50 CBS Radio Network, "The Steve Allen Show" and "Earn Your Vacation"

— Bob Rusk

# Truth in Advertising



**T**he hype for digital audio has been deafening. While digital offers advantages for storage and control, it has severe limitations for dynamics processing. Indeed, Cutting Edge® claims their Omnia unit sounds almost as good as analog.

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# Twin Cities Radio, More Than Weather

▶ MARKETWATCH, continued from page 27  
toes, you feel a challenge to remain for a few decades.

"In the Twin Cities, people come here to stay," said Marc Kalman, general manager of Chancellor stations KDWB-FM, WRQC(FM) and KTCZ-FM.

It would be unfair to connect the relative stability of Twin Cities radio to culture alone. Observers say that the Twin Cities is one of the most under-radioed markets in the country based on signals per population — a fact that makes each signal far too precious to gamble on an unproven or marginal format.

"People aren't going to take risks," said Tim Shears, general manager at WMNN(AM), which has an all-news format. What hasn't been risky lately is profits. In fact, according to the 1998 Duncan Radio Market Guide, the average

Two stations, WCCO and KQRS-FM, were dominant in radio ratings and revenue for a long time. In 1996, deregulation changed the marketplace as new

## 92 KQRS

players made big plays and radio groups like Nationwide Communications Inc., Colfax Communications and Shamrock Broadcasting left the scene.

"You essentially have three competitors that dominate this marketplace — ABC, Chancellor and CBS," Swartz said.

Chancellor Media owns seven stations in the market, accounting for about 30 percent overall. ABC and CBS have three each but account for a greater share because of their large flagship properties, KQRS and WCCO respectively. Along



Live Music at 104.1 The Point

explosion of product categories that didn't exist before."

For decades, the core of the stability in the Twin Cities was the "Good Neighbor" slogan of WCCO, whose tagline bears witness to the station wearing its wholesome Minnesota image on its flannel sleeves. It features a mix of news, sports, talk and weather. In 1991, CBS bought the station from Midwest Communications.

After implementing talent shuffles, it

## Minneapolis-St. Paul Radio Snapshot

Market Rank: 15  
Revenue Rank: 16  
Number of FMs: 19  
Number of AMs: 22

Estimated Revenue:  
1994: \$100.7 million  
1995: \$111.8 million  
1996: \$119.4 million  
1997: \$127.6 million  
1998: \$136.5 million

Revenue Growth:  
'91 - '96: 8%  
'97 - '01: 7% (est.)

Local Revenue: 80%  
National Revenue: 20%

1996 Population: 2,766,000  
Per Capita Income: \$17,856  
Median Income: \$40,649  
Average Household Income: \$47,449



Source: BIA's MediaAccess Pro

has worked hard to maintain the hometown appeal that kept it on top for years. Its importance to the community is obvious: A few years ago, the largest

See MARKETWATCH, page 44 ▶



KFAN's Chad Hartman and Dan Barriero broadcast live from Galyans.

annual radio revenue has increased 9 percent each year for the last five years.

"I think the entire market, including WCCO, has enjoyed the overall growth of radio," said Jim Gustafson, who recently resigned as general manager at WCCO(AM).

In 1997, Twin Cities radio stations recorded \$126 million in billings, up 12.5 percent from the 1996 total of \$112.4 million and up 7 percent from 1995 totals, according to Duncan's Radio Market Guide.

with local company Hubbard Broadcasting, owner of KSTP-AM-FM, these four groups account for the ownership of the top 15 stations in the market.

Despite the concurrence of healthy revenue figures and increasing consolidation, radio execs say the two are unrelated. Pounds said, "Rates have gone up, but consolidation is just part of the reason. What has masked this process has been the fact that we're in the midst of a great economy and an

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DBA is proud to introduce **BOB HARRIS**, an award winning humorist and commentator for KNX Radio - Los Angeles, whose loopy humor and keen journalistic eye earned him a 1998 Associated Press award for *Best Radio Feature* and the L.A. Press Club award for *Best Specialty Feature Reporting*.

Bob's credentials for capturing the attention of young adults is impressive:

- Nominated five times as Lecturer of the Year by *Campus Activity Today*... Bob has appeared on stage at over 250 college campuses.
- Widely published newspaper and magazine columnist including *Mother Jones On Line*, *The Funny Times*, *Z* and *National Lampoon*.

Want more? - Bob is a five-time *Jeopardy* champion, author of "Cramming 101" and has received accolades like these: "wickedly observant" - (Chicago Tribune), "One of the most talented political comics performing today" - (Cleveland Plain Dealer)

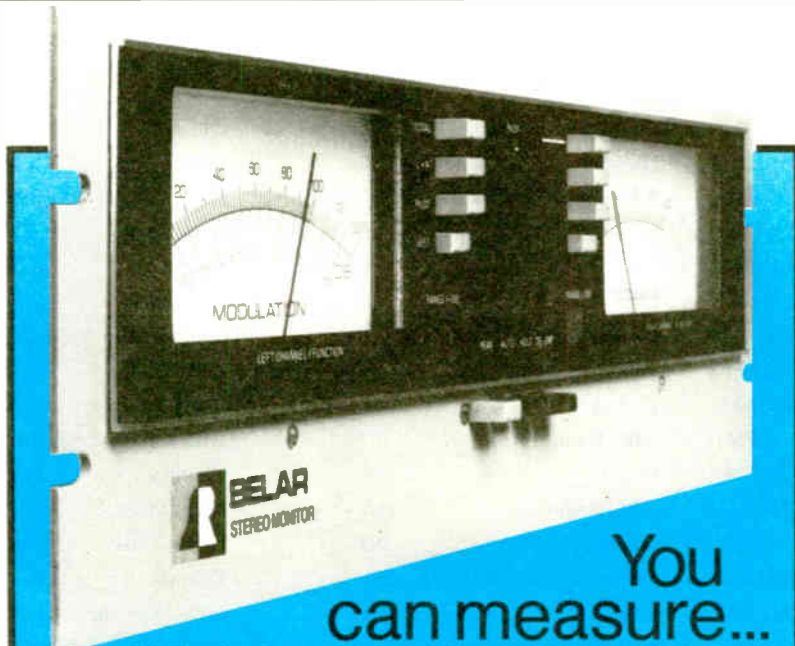
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# Format Juggling in Minnesota

▶ MARKETWATCH, continued from page 43 paper in Minnesota devoted significant space just to readers bemoaning the changes at the station. Despite the controversy, it's still at the top. Among Arbitron listeners 12-plus, it flip-flops with KQRS, a classic rock station, from book to book for top shares among all listeners.

Format juggling has been a byproduct of consolidation here. Larger players, in an attempt to offer a unified front, shuffled the formats of their stations. The most recent switch came at KMJZ(FM), a small jazz station picked up by CBS early last year, which switched formats to alternative rock. It now competes with ABC-owned KZNR(FM). "There are battles here you don't see in many markets

in this market." She said rock-formatted stations account for about a quarter of listeners in the total listening market.

"It's a young market and rock and roll sells," she said.



The other big seller on radio, which Waggonner attests to, is home-grown talent. KQRS' stellar ratings largely are due to Tom Barnard, the oft-controversial morning-drive host

who regularly posts shares of 30-plus. Barnard's dominance sparked one of the biggest wars in radio recently when Chancellor's WRQC(FM) brought Howard Stern to the Twin Cities.

When Stern came on air about 18 months ago, he easily jumped to the No.

Observers say Barnard's long-time presence and hometown roots will make



The Leanne Rimes softball tourney is hosted by K102.



Rock 100.3 WRQC hosted The Smashing Pumpkins' free outdoor show.

any more," said Kalman.

Amy Waggonner, general manager and president at ABC-owned cluster radio stations KQRS-FM, KXXR(FM) and KZNR(FM) said, "Rock and roll is huge

2 spot for adult males in the market, but he's had a difficult time carving into Barnard's overall dominance.

"Barnard is a Howard Stern who grew up in north Minneapolis," Pounds said.

him tough to bounce even though the shock jocks largely share the same shtick. "It takes a great deal of tenure in the marketplace to find a reasonable level of acceptance," WCCO's Gustafson said.

While the area maintains a thriving metropolis, the cities and the state itself remain heavily linked to agricultural and food-related industries.

### Stability

Huge economic growth spurts, common in coastal areas, rarely are seen in this region. But the area is relatively immune to the punishments those regions see in rough economic times. Annual radio reviews reflect the steadily growing

economic trend, particularly in the last five years, as stated in Duncan's Radio Market Guide.

The Twin Cities has a burgeoning retail market, driven by the success of the Mall of America and a healthy tourism industry.

Radio has benefited from the Twin Cities labor shortage. With one of the persistently lowest unemployment rates in the nation, employers have turned to radio advertising to find workers.

The Twin Cities are also laden with solid Fortune 500 companies such as 3M and Honeywell, and it prides itself on healthy arts and pro sports communities.

According to Duncan's, radio accounted for 18.6 percent of total media billings in 1997, while TV and newspapers dominated with 38.3 percent and 37.7 percent, respectively.



Tim Johnson is a Minneapolis-based free-lance writer. Reach him c/o RW.

## Minneapolis - St. Paul Radio Market Overview

Stations	Owner	1998 Est. Station Revenue in \$mil	Format	Spring 1998 12+
WCCO(AM)	Infinity	19.5	FullService	11.8
KQRS-FM	ABC Radio	22.5	Clsc Rock	11.2
KEEY-FM	Chancellor Media	9.0	Country	8.1
KDWB-FM	Chancellor Media	10.0	CHR	8.0
WLTE(FM)	Infinity	10.5	Soft AC	5.9
KSTP(AM)	Hubbard	5.5	Talk	5.3
KQQL(FM)	Chancellor Media	8.0	Oldies	5.2
KSTP-FM	Hubbard	11.9	AC	5.1
KTCZ-FM	Chancellor Media	7.0	AAA	3.8
WRQC(FM)	Chancellor Media	4.3	Rock	3.5
KXXR(FM)	ABC Radio	5.0	Rock	3.5
KMJZ(FM)	Infinity	4.0	Alternative	3.1
KFAN(AM)	Chancellor Media	4.0	Sports/Talk	2.2
KZNR FM	ABC Radio	1.2	Alternative	1.5
KLBB(AM)	Cargill	1.5	Nostalgia	1.4
KZNZ(FM)	ABC Radio	0.7	Alternative	1.0
WIXK-FM	Smith	NA	Country	0.8
KZNT-FM	ABC Radio	NA	Alternative	0.6
KSGS(AM)	Infinity	0.5	Urban/Olds	0.5
KXBR(AM)	Chancellor Media	NA	Country	0.5
WEZU(AM)	Smith	NA	MOR/Nostalg	0.5
KLCI-FM	HomeNet	NA	Country	0.3
WLLO(AM)	Cargill	NA	Nostalgia	0.1

Stations are ranked in order of Arbitron Spring '98 12+ share. Copyright 1998 The Arbitron Company. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Research through its MasterAccess Radio Analyzer Database software.



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## Mics Sound Better in the 'Valley'

**Ed LaComb**

This is a review dedicated to all of those pieces of equipment that play a background or ancillary role in the production studio.

These days, usually the fancy digital editors and automated consoles create the sparkle in a producer's eye. But let us not forget the basic gear that delivers day-in and day-out, stuffed away in some rack in the equipment room. This is the stuff that makes a passable announcer sound

discovered that these mics can deliver some ferocious *pops* with little or no effort on the part of the voice talent. Even on conservative compression settings, the 401 does a great job of reducing the effect of a big, fat pop.

You would not use the take in a critical recording session, but for general-purpose radio, it is nice to have this on your side.

Another thing I like about the 401 is its simplicity. In a single rackspace unit, the Valley Audio 401 provides a nice-

defeatable de-essing option for normal or heavy reduction and a gate/expander section which does a great job of cutting background noise.

Of course, there are also LED VU indicators and the final output section.

Overall, this is a solid package on which you do not have to turn the dials very far to hear a noticeable change, whether dialing in

some compression or altering the EQ. It is just what radio needs.

### Around the back

The back panel has some great features too, not the least of which are separate external circuit and chassis grounding post connectors that protect the signal ground from other gear that share your rack (hence your rack rails).

The 401 also has a separate, dedicated mic preamp output, plus an insert loop

See VALLEY, page 51 ▶



Galaxy Valley 401 Microphone Processor

good and a pro voice talent sound like the voice of the Almighty.

This is the world of the mic processor.

Some of the best voice talent in the country will tell you their philosophies regarding the microphones that make them sound their best, with little or no notice paid to the audio processing chain that was designed to complement that microphone.

### Good things from the Valley

In the next few paragraphs, I will talk about one of those unsung heroes in the audio world: the Valley Audio 401 Microphone Processor from the folks at Galaxy Valley Audio.

I have a lengthy list of things that I really like about this box. First out of the gate is the ability of the 401 to "tame" a condenser mic.

I don't know about you, but if you have ever used a Neumann U87 or an Audio Technica AT4033, you may have

sounding, balanced, transformerless pre-amp with plenty of headroom for everything from a low-output ribbon to high-output condensers. Many consoles do not provide a high enough quality pre-amp to handle some of today's best mics. Noise often gets a free ride along with your signal, especially with condenser mics.

The Valley 401 provides you with a preamp capable of 40 dB of adjustable range and a clipping LED to show overload. You also get a 48 V phantom power source for your condenser mics and an EQ section with response curves designed to improve the sonic performance of the human voice. In short, you will notice a great improvement in fullness, punch and brightness without added noise.

The compressor section is nice and punchy, and does not sound as if it is sucking the talent out of the chair when they pause for a breath. There also is a

## Compression: Is It Necessary, Helpful?

**Mel Lambert**

Along with improved audio quality and enhanced production techniques, digital has brought its own set of technical problems.

The most obvious problem is that digitized signals require sizable storage space and data capacity. The solutions are obvious: Use one of the various digital audio data compression schemes currently available to dramatically reduce the number of bytes required to store or carry PCM audio from one location to another.

But that is just the beginning of the story, as an increasing number of users are discovering. Different types of data-compression used in DAWs, playback systems and STLs affect the audio signal in different ways. Multiple applications of the same type/brand of compression produce audible

results, dependent upon the type of data being stored or carried along the data highway. And, even more vexing, different types of compression schemes utilized one after the other, in a predictable and/or random sequence, can produce results that are



How do you fit more data on the disk drive?

far from pleasant.

Of course, digital audio data compression, per se, is not the culprit. Perceptual coders are extremely useful for enhancing the record capacity of

See COMPRESS, page 55 ▶



## Trash your carts, burn CDs

Give all your production material the performance and reliability that only comes from CDs. CDs are the new standard in audio — compact, easy to use and efficient.

CD Architect is the professional mastering software that's accessible to untrained users. It verifies Red Book

standard audio before burning, fully supports PQ code editing, and lets you prepare the material in its own editor with multi-level undo.

From Sonic Foundry, the leader in Windows-based digital audio. Visit [www.sonicfoundry.com](http://www.sonicfoundry.com) or call us at 800-57-SONIC for more information.



# ◆ PRODUCT GUIDE ◆

## Products for Radio Production

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

### ICS High-Volume CD Duplicator

Intelligent Computer Solutions (ICS) has the CD MASter Infinity CD-R duplication system, a tabletop device suitable for syndicated radio program providers and advertising houses needing to create large volumes of CDs.

A robotic pick-and-place mechanism loads blank CD-R media into one of four Matsushita 4x-speed CD drives mounted inside the cabinet. Each recorder can duplicate a 74-minute CD in 18 minutes or less. The robotic mechanism then unloads completed media onto a spindle. Rejected or imperfect discs are moved to a separately fixed spindle.

Original content is stored on an

internal 4 GB hard disk. An intuitive touchpad control surface programs the CD MASter Infinity for unattended "lights-out" operation. All formats are supported by the device.

The CD MASter Infinity is avail-



able now for \$10,995.

For information, contact ICS in California at (818) 998-3190 or circle Reader Service 56.

### Big Fish Sample Catalog

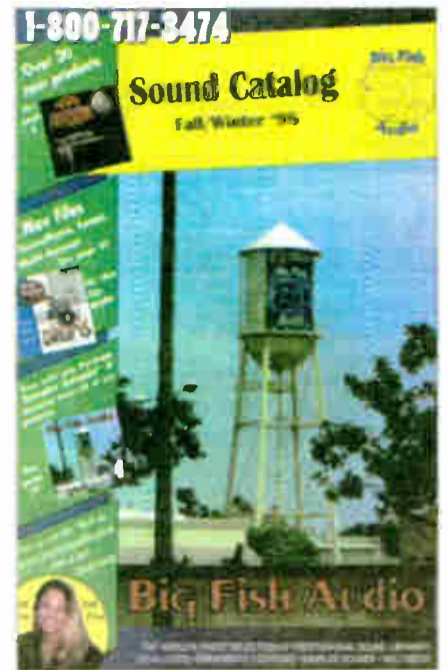
Big Fish Audio of Sun Valley, Calif., released its Fall/Winter 1998 catalog of sample CDs and sound-effects libraries.

Many products in the Big Fish catalog are for sample-based music creation and audio production. CD collections include drum and music loops for creating the underpinnings of Hip Hop and Dance music beds, synthesizer patterns and vocal effects.

Other CDs in the Big Fish inventory include Asian and Mediterranean instruments, cathedral organs and vocal samples. Big Fish is also a distributor of sound-effect collections from Sound Ideas, including the Warner Brothers and Hanna-Barbera cartoon libraries.

Catalogs and discs can be ordered via the company's Web site [www.bigfishaudio.com](http://www.bigfishaudio.com)

For information, contact Big Fish Audio in California at (818) 768-6115 or circle Reader Service 186.



### Telect Patch Panels

Telect A/V Signal Management has a line of audio patch panels offering analog and digital performance at the same price.

Telect uses an Umbilical Cable



Harness that lets you place the front and rear of the patch panel on top of each other or in different locations to gain easy access to both sides of the unit. The panels can be ordered for either conventional quarter-inch patch cords or Bantam-style plugs. Punch-down or pluggable connectors are

available, appropriate to the needs of the studio.

Panels come 2x24 or 2x48, with normals strapped, normals out or configured for half-normalled operation. Harnesses between units feature

Category 5 cable with twisted pairs and overall cable shielding.

Prices for the Telect patch panels range from \$755 to \$1,625, depending on features and configuration.

For information, contact Telect in Washington state at (509) 926-6000 or circle Reader Service 134.

### Tascam CD Recorder

Tascam introduced the CD-RW5000 Compact Disc Recorder, a \$1,299 standalone recorder for studio use.

The recorder supports all currently

The Sync Start feature of the CD-RW5000 allows the device to enter Record Pause mode and wait for an incoming Start ID from an external audio source. Internal sample rate conversion automatically translates a 48



available forms of CD media. A number of competing standalone units require the use of CD-R-DA (Recordable Digital Audio) or CD-RW-DA (Rewritable Digital Audio) formatted media and do not support the CD-R or CD-RW formats. The cost of digital audio media is higher than CD-R or CD-RW, due to consumer marketing licensing.

kHz DAT to standard 44.1 kHz CD sample rate. Front panel controls are as simple to use as those found on a DAT or cassette machine.

Details of the CD-RW5000 are available at the Tascam Web site [www.tascam.com](http://www.tascam.com)

For information, contact the company in California at (213) 726-0303 or circle Reader Service 31.

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— Dave Hamilton, New Radio Star

"It's difficult to go anywhere in Cool Edit Pro and not hear yourself whispering to yourself, 'this is amazing!'"

— Dave Olive, Radio and Production, May 1997



Check out our downloadable demo at: <http://www.syntrillium.com>



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▶ PRODUCT GUIDE, continued from page 46

**EMU-Ensoniq PARIS Version 1.8**

The PARIS hard disk recorder/editor from EMU-Ensoniq is now available in version 1.8. The new software provides redesigned screen graphics, compatibility with third-party plug-ins and multiple-card support.

PARIS is now compatible with Direct-X and VST plug-ins for the PC platform and all VST plug-ins for the Mac. Processing programs such as reverb, EQ and numerous specialty effects can merge seamlessly into the PARIS environment.

Support for multiple soundcards or single cards capable of multiple-channel I/O now enable the PARIS system to record and play back up to 32 channels of 16- or 24-bit audio simultaneously.

Improvements to the graphics now include color-coded knobs for easier identification, and two insert effects sections: one for native Ensoniq EDS-based plug-ins and the second for Direct-X and VST plug-ins running on the host computer.

For information, contact EMU-Ensoniq in California at (831) 438-1921 or circle Reader Service 4.

**Galaxy Mini-PA System**

Galaxy-Valley Audio of Kansas introduced the Core PA5X140 miniature monitor and PA speaker, a 13-pound self-contained amplifier and speaker capable of 146 W at 4 ohms.



A built-in compressor and automatic gain control keep levels tame and prevent clipping. Controls for three-band EQ and volume for two inputs are the front panel. The internal amplifier drives a Galaxy five-inch speaker. Distortion is less than .1 percent with a 4 ohm load.

The black case is made of a high-impact fire-retardant styrene. A cast aluminum grille is mounted over the speaker and entire face of the Core. Two output connections feed a second speaker and a Line Out.

See the RW review of the Galaxy Far Outlet on page 44 of the Dec. 23, 1998, issue.

For information, contact Galaxy-Valley Audio in Kansas at (316) 263-2852 or circle Reader Service 83.

**Symetrix 300 Series Components**

New additions to the 300 Series from Symetrix have been created for broadcast production and installed sound systems.

The 301 Low Distortion Comp/Limiter

is a single-channel unit with selectable Attack, Release, Threshold and Ratio controls. Inputs and outputs are on XLR connectors or Euroblock screw plugs. Frequency response is to 60 kHz.

The 303 Interface Amplifier is a bi-directional IHF-to-balanced level converter for interfacing consumer equipment to +4 dBu studio components. The 305 Distribution Amplifier is a one-in/four-out DA with less than .009 percent THD+Noise figures.

Finally, the 307 Dual Isolation Transformer is a passive isolation box with ground-lift switches and frequency response to 100 kHz.

All 300 Series products are half rack-width units, allowing two to sit side by side in a single rack space. List prices for the 303, 305 and 307 is \$199, with the 301 Comp/Limiter listed at \$249.

For information, contact Symetrix in Washington state at (425) 787-3222 or circle Reader Service 108.

**BTSG Cart Machine and Automation Programs**

Broadcast Technical Services Group (BTSG) has the SpotMax digital cart machine emulator for Windows 95.

The SpotMax places nine "cart machines" on a typical PC monitor. Each player can be triggered individually or can be set to play in a back-to-back sequence. A pull-down window with scroll bar highlights available audio cuts. A built-in audio recorder and digital editor are included in the \$149.95 price tag.

BTSG also has the ClipMax instant access clip and effects player, a \$99.95

software package that places a 32-button immediate playback device inside a stock Windows 95 PC with soundcard.

The ClipMax is capable of immediate playback of both WAV and MPEG files. All buttons are user-programmable, as are the PC keyboard's function keys F1 through F12. There is no delay when an on-screen button is clicked for audio.

BTSG is also the manufacturer of the AutoMax 3000 VT satellite/live assist automation system, designed to work with conventional Pentium computers. The AutoMax is capable of triple-layer overlap for voice tracking and segues, satellite integration and program log importing with its own Max Log Utility system, included in the \$1,095 price.

For information contact BTSG in Houston at (281) 812-2384 or circle Reader Service 136.

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## BOOK REVIEW

# New Book Offers V/O Foundations

Alan R. Peterson

There is a mighty wide chasm between being a radio *announcer* and being a *voice actor*. This point is driven home quite often in these pages, courtesy of **RW** columnist "Travis the V/O Guy."

A new book, "The Art of Voice-Acting," by James R. Alburger (1999, Focal Press) may be what is needed to break out of the "radio" mold and forge ahead with a successful career in voice acting.

Alburger knows where he is coming from. A director, sound designer and

audio producer for 25 years, Alburger has nine Emmy awards and a solid track record with an NBC TV affiliate in San Diego. The information he imparts in the 256-page "The Art of Voice-Acting" is clear and down-to-earth, with sample scripts and points of analysis that make commercial copy more than simply words on a page.

## Roll your own

Many jocks I have known have cut together their own "voice-over" demo reels with spots and promos from their stations. These efforts met with little success, as every cut sounded *an-nounced* with no

variation or interpretation. A "disease of the week" TV movie promo sounded no different from a nightclub commercial.

Alburger addresses this early in the book, on page 12. A single-voice 15-second news promo script is followed up by an analysis of the copy. Specifically, what is the emotional hook, what visual images are created by the copy, what sort of read is most effective and many other points.

Following this exercise, Alburger directs the reader's attention to the basics of breath control, diction, relaxation and the need to begin *liking* one's voice and getting used to hearing it on tape. Included in the book are health tips for

keeping the voice strong and resonant, as well as a recipe for a nasal saline rinse to keep sinuses clear.

In the chapter "Taking Care of Your Voice," Alburger included some warm-up phrases that just may prove how un-ready someone may be for this chosen career:

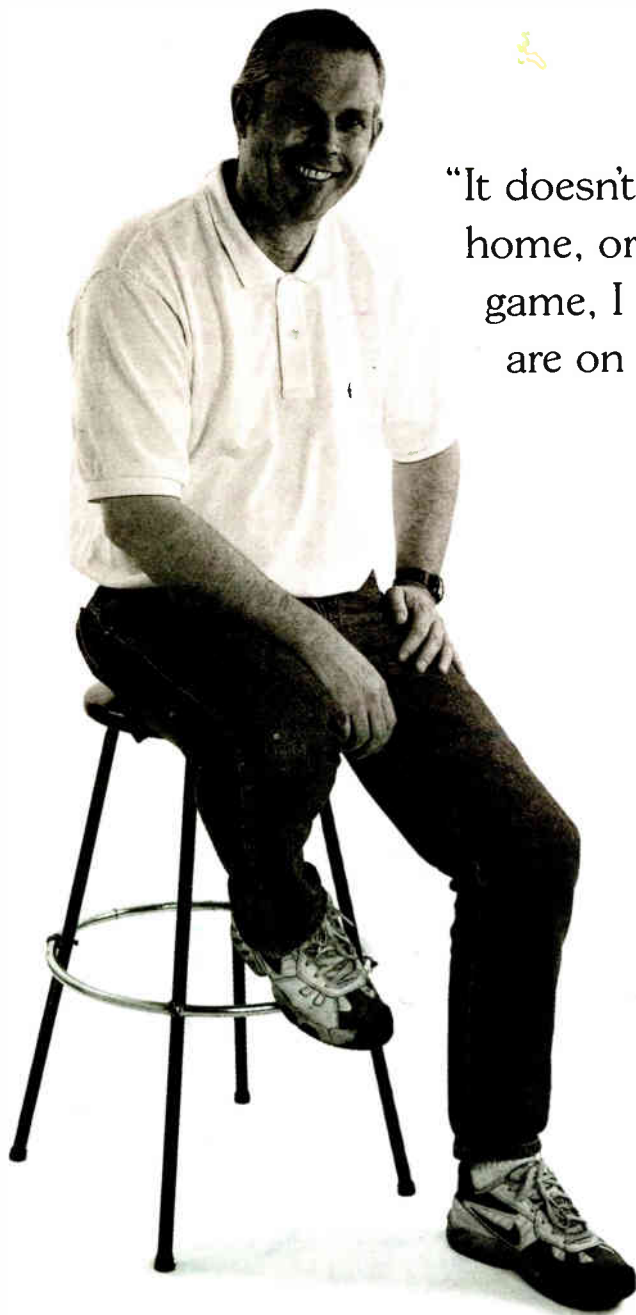
*"She stood on the steps of Burgess's Fish Sauce Shop, inexplicably mimicking him hiccuping and amicably welcoming him in."*

Continuing through the chapter on Character Copy, Alburger provides suggestions and appropriate script material to help the reader develop voices for animation, commercial characters and celebrity impersonations, including a piece of commercial copy that would be right on target if read by Robin Leach.

## Underway

"The Art of Voice-Acting" leads the reader through the procedures of creating a demo tape, procuring an agent, unions and payment, and what can be expected at a session.

The voice performer brought up in a



"It doesn't matter if I'm at work, home, or my son's little league game, I know our transmitters are on the air."

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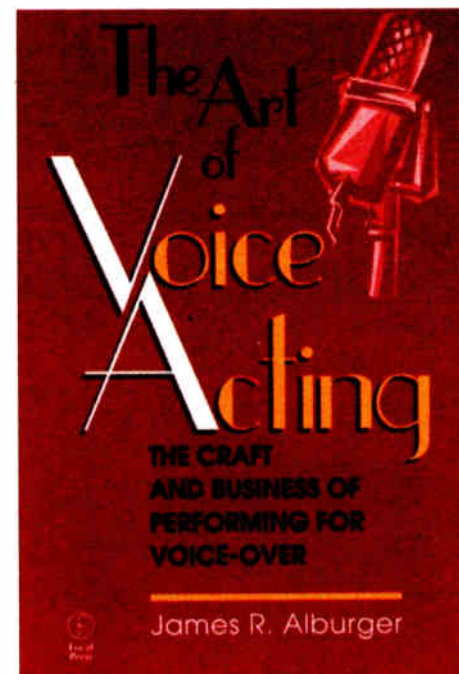


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radio environment would be surprised to see the notation "Don't touch any equipment" on a Dos-and-Don'ts checklist, but indeed there it is. The actual procedure in the professional environment is to leave mic placement, EQ adjustment and machine operations to the technician. The copy stand is the voice performer's entire domain.

## Watch your wallet

A book is not an entire education, and Alburger recommends classes and workshops to help hone and refine a voice actor's talents. To his credit, Alburger warns the reader of scams where classes and workshops charge high rates for producing and marketing a demo as part of the educational process. Among the reputable classes and workshops available, there will always be someone out there ready to grab your money. Alburger's warning may save you grief.

There are numerous texts available for budding voice talents, but Alburger's new book, "The Art of Voice-Acting" is effective in its treatment of interpretation and artistry as well as its emphasis on the business side of voice work.

■■■

Focal Press is an imprint of Butterworth-Heinemann and can be reached in Massachusetts at (781) 904-2500; Web site [www.bh.com/focalpress](http://www.bh.com/focalpress) or circle Reader Service 161.

# The Secret of Voice-Over Success

## Travis

The following message is a merging of five e-mails I recently received. The subject of all these messages was essentially the same.

"Hi Travis. I've been in the voice-over business for about 10 years. However, I have been quite disappointed with the way my career has been progressing. I know I'm good.

I've done some excellent work, but it seems that there are a lot of people who get a more work than I do who aren't nearly as good as I am. It sounds as if you work all the time, while I'm lucky if I can get a couple of small jobs a month. I have an agent who is supposed to be good, but I almost never get any work through him/her.

Almost all of the work I have gotten, I got myself. Am I doing something wrong, or is it all just luck?"

### Time journey

Before I entered the field of voice-over, I operated a production recording facility, where quite a few voice-artists came in to record.

I realized early on that the amount of "talent" that a voice-over performer possessed did not seem to affect that performer's career success as much as I would have expected. As I started working as a performer, these issues became even more important.

As I got to know a few voice-over people and actors myself, I noticed the same factors — whatever they were — at work. Often, lesser-talented individuals would do quite a bit better than many I knew who were very good.

I asked myself, what is it that makes a performer successful? Is it just luck? Is it talent? Is it something else? If it was pure luck, why did the same people always seem to do well? Are they just lucky?

After years of studying this, I am now convinced that, for all performers I know — actors and voice talent alike, including myself — success is just that. Pure luck.

Now if that were the end of the story, I could just zap this piece to **RW**, turn off the computer and go home. But, as you might expect, it is not. There is a lot more to this subject.

I am not the only person to figure out that luck is the determining factor in showbiz success. There have been a lot

of others who have written at length on this subject.

One of the first people I encountered with this point of view was a successful actor, who was teaching my acting class. He pointed out that, in an audition situation, you have no control whatsoever whether you will get the part. Too much is out of your control.

He said one of the most important things a performer must do at an audition, is to "let go," to allow the casting director or whomever to think whatever they are going to think. "You can't make somebody like you," he said.

I eventually realized that he was right. I had seen enough auditions at my studio to know that the people who got the parts were simply at the right place at the right time. To put it in one word, luck.

There are two things I wish they had taught me in school: Most of what happens to you in life will be due to pure luck, and you *do* have considerable control over the kinds of luck you will have.

I began to notice that the performers who worked to improve their luck did better than those who attempted to control individual situations. The successful performers, knowing that success comes from being in the right place at the right

**You must put  
30 hours a week,  
50 weeks per year,  
into growing a V/O  
business.**

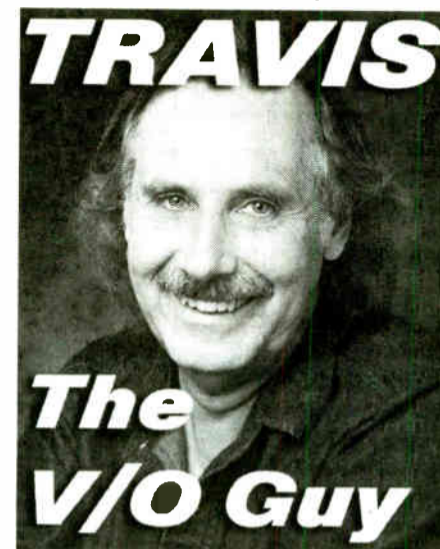
time, manage to be at the most places at the most times. They all put considerable time and effort into improving their luck.

I don't mean to suggest creating some sort of metaphysical magic to improve luck. I am referring to good-old-fashioned marketing.

As a performer, *you* are the product. Nobody is going to market you but yourself. You might be the greatest voice-over person in the world, but if nobody knows about you, you will never get hired. The more time you put into marketing yourself,

the better "luck" you're going to have.

I have been able to reduce this whole "success" thing in voice-over/acting to a simple, though somewhat approximate, formula: *In order for your business to double each year, you must put 30 hours*



*a week, 50 weeks per year, into growing that business.*

So, for the typical person just getting started, that means putting 30 hours per week, 50 weeks per year to get that first voice job. If that person does not get discouraged and continues to put in 30 hours per week, that person will probably get two gigs. The following year, four jobs, and so on.

I realize this formula may be extremely discouraging to many people. On a more encouraging note, however, you find that, after seven years, this formula shows that our performer should be getting 64 jobs per year, or probably enough to "give up the day job" and go into voice-over full-time.

The business will continue to grow until the performer either gets too busy working or gets too lazy to put in the 30 hours per week. If the "marketing time" is reduced to less than 15 hours per week, the business will start to decline. Naturally, your mileage will vary.

### Filling 30 hours

Now consider what activities to include for those 30 hours. It depends on who you are.

One of the first things you will need to do is to determine what works for you. Everyone is different, with different marketing skills. For some, it means

distributing that voice-over demo. For others, it means attending professional meetings and still other individuals will benefit from on-line or telephone communication.

If you are an on-air talent, you can probably include some of your air-shift material. Voice-over work usually counts, but only if it is likely to lead to more work.

Oddly enough, voice-over or acting classes *don't* count, unless the teacher or others in the class are connected in the industry and might lead to your getting work. Certainly, it is important to work on your skills, but you need to do that for other reasons than success in the business. I will cover that in a future article.

### Name dropper

I once presented my "formula" to the acting teacher I told you about earlier. He responded with, "Travis, that's ridiculous. I don't put in anywhere near 30 hours a week. I've just been lucky."

I asked him what he was doing yesterday. "Certainly not marketing myself. I was playing softball!" I asked him, "Who with?"

"Well, Tom Selleck was on the other team," he said, then went on to list a bunch of actors, directors and casting directors for all kinds of Hollywood movies and TV programs.

"What about the day before?" I asked. "Well," he said, "I had a couple of auditions, and then I went to sing karaoke at a local joint."

"And who was at the karaoke place?" I asked. He rattled off another list of actors and directors.

We then checked through the entire week, then the previous week. While he was out having fun, everything he did was in some way or another improving his "luck" in the business.

And that's my point. It is important to find ways to spend that 30 hours in some way that is enjoyable, because if you don't enjoy it, you won't continue to do it.

If you look for success in voice-overs, it is important to find enjoyable activities that will improve your "luck" in the voice-over business. And to spend those 30 hours per week doing them.

■ ■ ■

"Travis the V/O Guy" is a veteran voice-over artist writing from California. Send e-mail to [ttravis@pacbell.net](mailto:ttravis@pacbell.net)

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## PRODUCT REVIEW

# Voyetra Makes PC Into A Hip Hop Machine

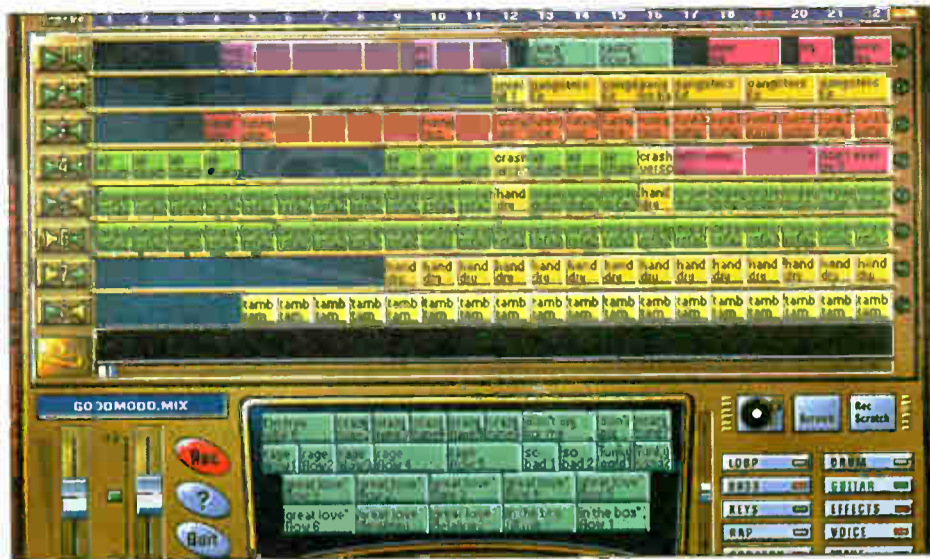
Alan R. Peterson

I got a pretty neat toy for Christmas last month: the Hip Hop eJay, developed by PXD Musicsoft and distributed domestically by Voyetra Turtle Beach. This is a multitrack music loop creator somewhat along the lines of the Sonic Foundry "Acid" series, but is available for about \$40 list, or closer to \$30 on the street.

Hip Hop eJay lets anyone create hip hop music beds by clicking and dragging

color-coded drumbeats, rhythm loops, bass slaps, vocals, effects and more into an eight-track multitrack window. Instant production beds and background textures can be created in moments with little more than your ears and a mouse.

At 30 bucks, I expected a few omissions, and I was right. Hip Hop eJay lacks the ability to stretch and transpose a sample up or down in pitch without altering the tempo of a loop the way Acid does. But the Hip Hop eJay also gave me plenty to play with for my \$30.



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The CD-ROM comes with more than 1,000 samples, as well as a cute virtual turntable interface that allows the "scratching" of an audio element with the mouse. The turntables bear a resemblance to the deejay favorite Technics SL1200MKII unit.

The Hip Hop eJay is one of three sample-based products created by PXD Musicsoft. For the moment, only the Hip Hop version is available from Voyetra Turtle Beach, but there are demos of the other two on the CD-ROM.

The Hip Hop eJay takes advantage of Microsoft DirectSound, where multiple sound files can be played back simultaneously under Windows. The program requires a minimum Pentium 66 with 16 MB RAM and DirectX to function. I ran the program on a 333 MHz Pentium II.

For anybody used to programs such as SAW or Cool Edit, Hip Hop eJay works in a similar fashion. Open a File Folder, click on a WAV file and drag it into the multitrack window. Hip Hop eJay automatically snaps each to the downbeat of each measure (the timeline shown at the top of the multitrack window).

The File Folders are labeled on-screen with the names of each instrument. Click the drum button, up come the drums. For voices, click that particular button and a scrollable window shows what vocal events are in the queue.

#### Put it anywhere

You are not limited to where you may place an event. For example, nothing in the program says the drums must only reside in Track 1. For that matter, it is possible to drag a shorter unrelated event on top of a longer one. Hip Hop eJay will play the longer one until it encounters the shorter one and play that file.

The first evening I used it, I had the program open for five hours and had a lot of fun with it. The massive amount of samples offered lots of variation within the genre. The ability to drop a specific audio event anywhere within the overall composition permitted me to insert stingers and ancillary drumbeats on anticipated copy points.

The final mix can be exported to a single WAV file, or can be recorded off-line by plugging a DAT or MD recorder into the soundcard on the PC.

Voyetra Turtle Beach is marketing this product to consumers and computer users to create modern hip hop beds, primarily for fun or Web-posting. However, there are definite production uses for the eJay.

When you think about it, the virtual turntables are little more than a digital scrubber. You find this feature in high-

See HIPHOP, page 51 ▶

► **HIPHOP**, continued from page 50  
end products such as the Orban Audicy and the 360 Systems Short/Cut, and also in budget editors such as Fast EDDit from Minnetonka Software. Having a scrubber — even a rudimentary one — in a \$30 program is a bargain.

While scratching with a mouse is an unpredictable process at best, it is an easy skill to pick up. And a nine-dollar mouse is cheaper to replace than blunt styli and torn vinyl.

You may use your favorite WAV editor or the built-in recorder to record and trim your own files to use in Hip Hop eJay. Drum sets can be made of bits from sound-

busy to navigate through easy, although there was one feature I especially liked in the Rave version: the Hyper Generator.

This is a mini-sequencer tied together with sliders for low-pass filtering, echo and distortion. There are a small keyboard and a series of holes resembling a piano-roll on the screen. Click the holes to fill in a musical pattern, work the modifiers, and you have a new sound to drop into your composition.

Again, for \$30, you may believe there will be some limitations to Hip Hop eJay. You are basically locked into compositions in G Minor at 96 beats per minute (bpm) when using the included samples.

Whereas the more expensive Sonic

gram's Quit command. This is too easy a key to hit in the heat of battle.

Hip Hop eJay has no Windows Menu bar, ergo no pull-down Exit commands. I would feel safer if the program used the less-common Alt-F-X or Alt-F4 commands as found in DOS and Windows to exit.

Finally, the startup for Hip Hop eJay is a lengthy procedure that includes a video presentation/beauty shot of the program every time it is launched. I hit the Escape key and it jumps right to the program.

For \$30, I have a lot to say about Hip Hop eJay that is good. After all, most production folks I know drop more than that per week for lunch.

The program is fun, it is versatile and creates useable compositions that can be used alone or as the skeletal framework for more elaborate pieces. The samples found on the CD make it worth the price: dedicated sample discs cost \$99 elsewhere. If you have some existing sample CDs clocked at 96 bpm, you may still use them in Hip Hop

eJay for even more creative play.

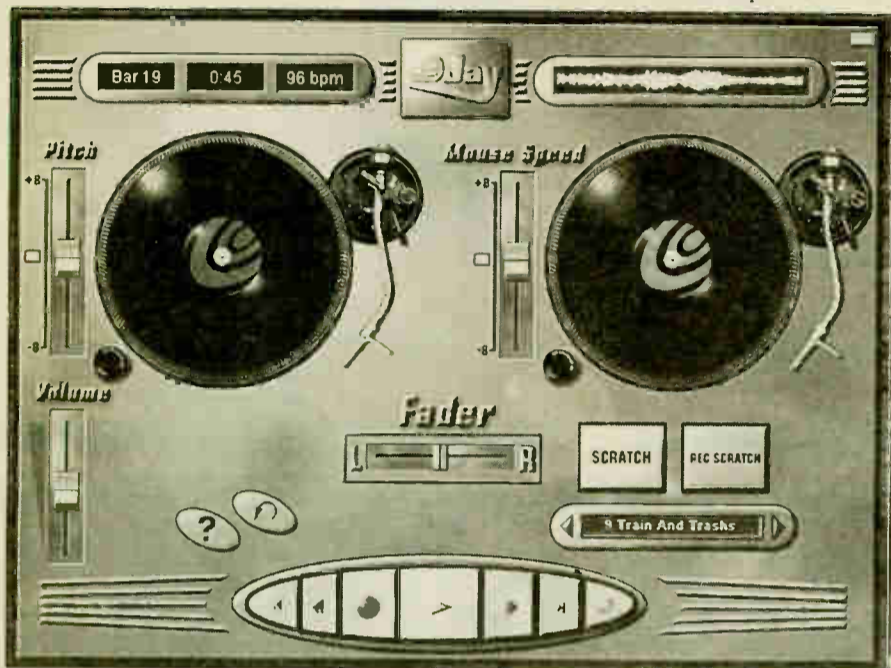
Should PXD and Voyetra Turtle Beach decide to release the Rave and Dance versions of eJay, I hope they address the graphics issue: the visuals in both programs are too game-like and distracting to sit in front of for very long.

Hip Hop eJay is a new product and is likely to be found in a computer retailer or a music store near you right now. A demo can be downloaded from the Voyetra Turtle Beach Web site, but the demo is 25 MB in size and may take up to two hours to download.

If you have 30 bucks burning a hole in your pocket, pick up Hip Hop eJay. It will make you smile and make everyone around you at the station think you are down wid it.

■ ■ ■

For information contact Voyetra Turtle Beach in New York at (914) 966-0600; visit the Web site [www.voyetra.com](http://www.voyetra.com) or circle Reader Service 211.



The turntables let you scratch an effect against the finished piece.

effect CDs and vocals replaced by historic actualities or TV sound bites. There are a couple of technical caveats I will explain in a few moments.

Do not use Hip Hop eJay as your only production multitrack recorder. Its tendency to snap audio events to marked time references and its limited pan abilities (hard left, hard right and two-channel mono) negates any such use. But then again, you already have a DAW for that, right?

Dig into the CD-ROM and you will reveal two demo programs. Rave eJay and Dance eJay. Both have small sample libraries and time limits on use. I found the graphics on both very distracting and too

Foundry Acid program can independently transpose and stretch samples in pitch and tempo. Hip Hop eJay slides both together, much like the pitch control found on turntables. If you intend to create your own samples to use in Hip Hop eJay, you must edit and trim them to work within 96 bpm.

The CD-ROM must remain in the drive to run the program. This can be a pain when switching between other audio programs demanding the drive for instructions or as part of each one's copy protection scheme.

I was glad to find the accepted convention of "Spacebar = Stop/Start" used here, but noted the Escape key activated the pro-

## Processing Vocals With Valley 401 Unit

► **VALLEY**, continued from page 45  
input and output patch points on balanced quarter-inch TRS connectors that allow you to connect other outboard boxes to the 401. Inputs and outputs are all balanced XLR connections.

The output can be switched between low-impedance, high-level +4 dB and mic level -50 dB. This is a handy feature if you run out of mic input channels on your mixer and need to latch onto a line-level input.

One thing I wish was different is the choice of frequencies the three-band EQ section addresses. To my ear, I like the midrange section to play around in the upper-3-kHz-to-low-4-kHz range. That frequency really pops out on the air. Instead, the Valley 401 tweaks the mids in the 2 kHz range, ±15 dB. It's a subjective call, but it's my two cents.

I do like the tag-team performance of the compressor/expander sections. Even when set aggressively, the noise

gate releases slowly enough to hear the whole word without up-cutting.

The de-esser section has two modes. Normal, for mild problems, is typically where I left it set. In the Normal mode, sibilance is addressed from 8 kHz and above. For abnormal situations, the Valley 401 offers a heavier de-ess mode to handle sibilance from 4 kHz and up. Crank the compression and you will not notice much de-essing going on.

Even if mic processors are not the first things that catch your eye in the studio, there is no question that they catch your ear. In the battle for listener attention, the Valley 401 mic processor is a formidable weapon.

■ ■ ■

For information contact Galaxy Valley Audio in Kansas at (316) 263-2852 or circle Reader Service 185.

Ed LaComb runs his own voice-over and imaging business in Syracuse, N.Y. He can be reached at [edlacomb@aol.com](mailto:edlacomb@aol.com)

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**READER SERVICE NO. 22**

# Even More Gourmet Tape Tips

*When Irreplaceable Recordings Are on the Line, Think Twice Before Putting That Tape in the Oven*

**Al Quaglieri**

In October 1998, *RW* printed an article from jingle producer Ken R. describing how he saved a classic jingle tape from degradation by baking the reel at a controlled temperature ("Tape Baking Tips for Production Gourmet," Oct. 14).

In the interest of preserving great and irreplaceable recordings, music reissue producer Al Quaglieri sent the following.

I produce reissue CDs for Sony Music and must deal with the sticky-tape problem every day.

I would like to offer some additional points to Ken's timely advice.

Even if you can get a vintage tape to play and all appears well, start by playing either a blank or unimportant segment of the reel for a full minute.

Stop the tape and swab your heads and rollers. If they come back black or brown, bake the tape.

Damage on an unimportant part of the tape means nothing is lost. But whatever high frequencies that tape once held in an irreplaceable passage of audio will end up stuck to your heads, irretrievably lost.

The stickiness is both a chemical breakdown of the tape binder and the presence of moisture. Baking in a conventional oven stabilizes the binder, but does not go far enough in removing the moisture.

The best appliance for that is a consumer-model air-convection oven such as the Farberware.

This costs only a couple of hundred bucks and is well worth the investment if you deal with old tapes on a regular basis.

**Watch the temperature**

Temperature regulation on home ovens and convection ovens is not as accurate as it should be. Buy a meat or photographic thermometer, keep it visible, and adjust the temperature accord-

ingly. You do not want to bake the tapes above 130 degrees F.

Although eight hours has become the de facto standard baking time, reels with less severe problems often play quite well after four, five or even one hour of baking time. The less time a tape has to

**Observations**

This means that brand-new reel of your favorite formulation will likely break down into a sticky mess in due time. I now routinely have to bake tapes made anytime in the 1980s and have heard of tapes made just three years ago

**The problem tape began production around 1971, and the scary part is that it is still being produced.**

spend in the oven the better.

Tapes can be baked more than once: I have played reels baked four or five times. However, after each play they lose a little more HF information and along with it some perceived "snap" and audio presence. Archiving after the first baking is a good idea.

Ken R. stated that the tape formulation was changed in the mid-1970s, and implies that only tapes of that vintage will pose

needing similar treatment. This is a serious problem.

Tape stickiness and shedding often are brand-related. Nearly all Ampex reels from 1971 onward need some sort of treatment. Scotch is much less problematic. BASF is 50-50 and Agfa is the most stable. This is a fact-based observation and should not be construed as endorsement of any brand by either Sony or me.

**Redo splices**

Contrary to Ken's experience regarding splices, I say be prepared to replace all the splices in a baked reel. The baking process tends to dry them up as well. Play it safe.

I would not recommend re-archiving to DAT, which is as yet unproved as a long-term storage media. I have two-year-old DATs that will no longer play. CD writers are so cheap now, I would go that route.

As time marches on, I begin to find reels that are no longer cured by baking — most recently, the single master for Wild Cherry's "Play That Funky Music." This is an ominous sign and bodes ill for an entire generation of tapes.

If you have jingles, airchecks or programs from the '70s or '80s sitting in your closet, save them now if you ever plan on listening to them again.

Al Quaglieri is a reissue producer. Reach him via e-mail to [alcue@albany.net](mailto:alcue@albany.net). *RW* welcomes other points of view.

## 24/96 Standard Means Bigger Drives

Giving some thought to doing production under the new 24-bit, 96 kHz amount of platter capacity consumed by one minute of linear (uncompressed)

	3.2 GB	4.5 GB	6.4 GB	8.6 GB	10.2 GB	12.7 GB	18.2 GB
32 kHz	6.9 hrs.	9.7 hrs.	13 hrs.	18.6 hrs.	22 hrs.	27.5 hrs.	39.5 hrs.
44.1 kHz	5 hrs.	7 hrs.	10 hrs.	13.5 hrs.	16 hrs.	18.6 hrs.	28.6 hrs.
24/96	1.5 hrs.	2.2 hrs.	3 hrs.	4.2 hrs.	4.9 hrs.	6.1 hrs.	8.7 hrs.

standard? Hope you have a lot of hard drive space.

The storage requirements for 24/96 are 4.5 times greater than the 16-bit, 32 kHz sample rate generally used for radio production and about 3.26 times greater than 16-bit/44.1 kHz. A 16-bit, 32 kHz stereo recording normally occupies 7.68 MB of drive space. The

amount of platter capacity consumed by one minute of linear (uncompressed) stereo audio in the new 24/96 format is a surprising 34.56 MB!

Put another way, a common 3.2 GB computer hard drive — normally enough for seven hours of 32 kHz stereo audio — is now only large enough for roughly 90 minutes of 24/96 audio.

According to Bob Lentini, president

of Innovative Quality Software — makers of the SAW line of digital workstation programs — the math behind 24/96 is not deep, but it does wake you up.

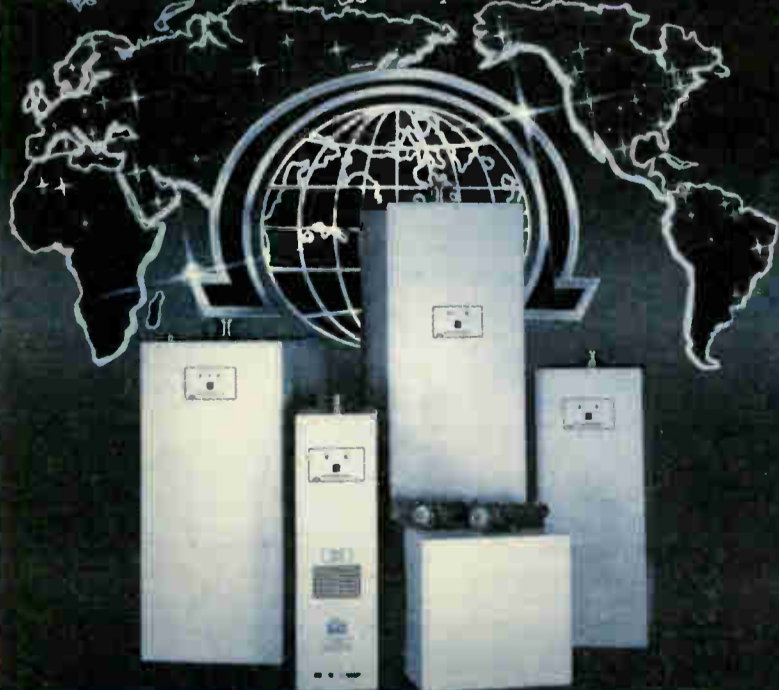
"There are three bytes per sample," he said, "times two for stereo, then times 96,000 samples per second, then times 60 seconds for the minute." The latest IQS product, SAWPro, is capable of 24/96 recording and editing.

Shown here is a table of popular drive capacities and the approximate amount of time available on each, based on sample rate. Refer to this table for storage requirements if you decide to investigate 24/96 in your studio.

— Alan R. Peterson

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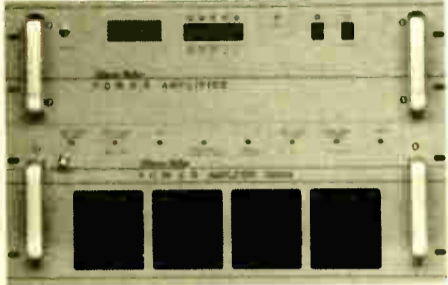
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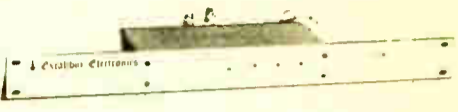
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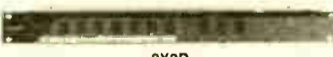








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**READER SERVICE NO. 100**



# Compression and When to Use It

► COMPRESS, continued from page 45  
hard drives and optical media, accelerating the transfer rates of such devices, or for improving the data capacity of a satellite or terrestrial link.

Available algorithms from APT, Dolby, Musicam licensees and others do a great job of removing redundant data from digital bit streams, through a combination of masking and related techniques.

Applied one, twice, or possibly three times to audio material, they produce no discernible effects. Perform the process several more time times, maybe between formats, and you soon realize that something is decidedly odd.

## No free lunch

It is a given that all perceptual data compression systems are going to degrade audio quality. There simply is no free lunch. Some systems can produce noticeable artifacts on previously compressed material; post-compression signal processing, including EQ, will also alter the signal in predictable ways.

Other factors to be considered in broadcast-related applications include:

**Encoding delay:** Musicam involves an encode delay of around 20 ms, and a decode delay of just under 20 ms; time-based compression schemes, such as the apt-X 100 system, for example, require 3.8 ms to perform a complete cycle:

**Stereo imaging:** Adaptive bit allocation offers enhanced levels of data compression, by individually processing channels, rather than treating them as a stereo pair, but can cause audible image shift on two-channel signals:

**Multiple generations:** While less-aggressive sub-band ADPCM systems, for example, could be used safely up for as many as eight to 10 encode/decode cycles, others with enhanced reduction ratios might need to be limited to one or two generations.

Tandem or sequential coding is a more important factor. The overall effect of Coding Scheme A followed by Coding Scheme B is virtually impossible to predict, because it is highly dependent upon a myriad of variables.

## Reality sets in

Maybe we need to face an inevitable truth. For single-generation recording and playback, the majority of new data-compression schemes perform extremely well. But in many applications, we need to ensure that we understand the full implications of living with multiple generations of data compression, tandem coding and the other practical realities.

Many AM and FM stations have installed recorders, automation systems, STLs and other components that base their operation on data-compression schemes. It behooves us at least to calculate the maximum number of stages of encode/decode data compression during the passage from source to air. If small and predictable, it makes sense to use data compression — with a word of caution regarding sequential coding with different types of transform and/or ADPCM-type compression schemes.

Many stations are going to run into problems, however, where the number of generations of sequential coding

becomes large or unpredictable. When different compression schemes are used during a signal's passage from source to air, we begin to see the magnitude of our problem.

How is a broadcaster to know how many generations of data-compression a particular signal has suffered? Currently, the only way is to document carefully the types of compression used at each stage in its production, and hope that such information remains with the data.

If the label attached to the playback media is sufficiently large — and the engineering staff sufficiently diligent — then we might be able to track the process.

What makes more sense would be to attach such information to the data

itself. Usefully, there exists within a standard AES3-format signal sufficient bits to encode a great deal of information about the signal's source and production history.

## Up to date

When a situation exists that such data can be updated each time it encounters a recording boundary — such as transfer to new media or subjected to a data-compression process — then this information could also be updated by a DSP chip.

Also it makes sense to carry data-compressed bit streams over digital interfaces, rather than implementing an additional stage of decode/encode. If the recorder is holding data-reduced audio,

why not simply connect it straight into the hard disk?

Specific bits added to the data stream easily can identify the encoding scheme and compression ratio used on the source. Such data then can be detected at the workstation's input section, and used to make rational decisions about its fate.

The plunging price of hard-disk storage means we can go uncompressed for less money than before. Compression is a moot point.

But if you need to use compression within your facility, apply enough to strike a compromise between fidelity and storage limitations, and keep depression cycles to an absolute minimum.

■ ■ ■

Mel Lambert is international marketing director at Otari Corp. and a regular contributor to RW.

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# Compression Saves Jocks Cash

Gowan Grey

The current interest in — and debate over — compressed audio has revealed an interesting side benefit: It may now be a lot less expensive for voice or air talent to go looking for that next great gig.

The popular Cool Edit audio editing product from Syntrillium Software comes with a RealAudio encoder, and Sound Forge version 4.5 has a built-in MPEG encoder. By applying the proper compression settings, an aircheck or demo reel can be squeezed down to fit on a conventional 1.4 MB floppy disk, with better quality than standard cassette demo tapes now mailed out by prospective talents.

After editing a WAV file in either of these software editors, it is possible to save a version in any variation of the RealAudio (RA) format or MP3 scheme. A typical demo reel or aircheck of up to four minutes can actually be stored on a single 1.4 MB floppy disk. The savings in postage and packaging can be significant, with better than 50 percent savings realized in stamps alone.

## Cutting edge

It is not uncommon for stations — especially those programmed as cutting-edge and progressive operations — to have PCs configured for RealAudio or MP3 playback. A program director or voice casting director would do little more than insert a floppy and click "Open File" on the player to play back a demo in either format.

I have tried these methods on three computers and found the disk drive fast enough to stream the audio in real time or even dump the entire file directly into RAM for playback rather than buffering shorter portions of it.

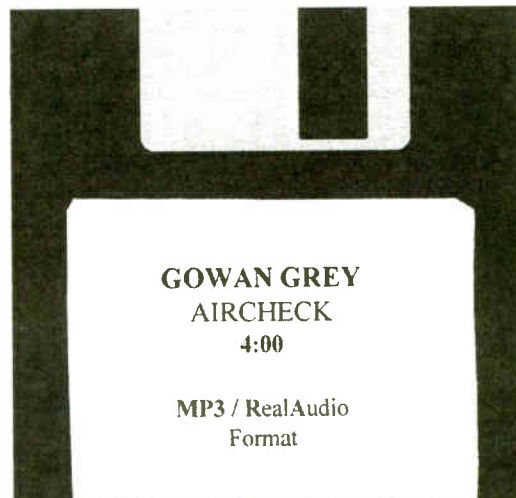
When saving an RA file in Cool Edit, I have ascertained my optimum setting to be "RealAudio 3.0 — ISDN Mono, 22,050 Mono," which can be found under the "Music" encoding menu. My four-minute music sample, originally a 15 MB mono WAV file sampled at 32 kHz, was compressed to 1.212 MB.

The recording picked up some arti-

facts and noise, but this is not unfamiliar to RealAudio users. This setting also provided reasonable fidelity through typical small computer speakers.

Similarly, the same four-minute WAV was squashed down to a 784 kB, 32 kbps/16 kHz mono MP3 file in Sound Forge.

Both formats sounded as good as a



Aircheck on a Disk: Possible, but not Pursued

cassette, and there was enough room left over on the MP3 floppy to include a second cut. Voice-over talents could include an alternative demo, while radio talent could provide a production sampler.

A more elaborate MPEG encoder, the AudioActive Production Studio from Telos Systems, provided me with more

compression options than did Sound Forge 4.5, and allowed me to fit a more relaxed 1.4 MB of data onto the floppy.

There are benefits and drawbacks to compressing an aircheck to a floppy. The medium is a standard — with the exception of the Apple iMac, practically every commercially available computer has a floppy drive.

The biggest benefit is saving money. A floppy disk weighs and costs less than a cassette with soft plastic case. The disk is not as fragile as a cassette and can handle a degree of flexing as it travels through the mail.

Further, the dimensions of a floppy disk eliminate the need for a heavy padded envelope. A stiff cardboard mailer or letter-size envelope with a cardboard stiffener is enough reinforcement to assure a safe arrival.

A lighter package is also cheaper to mail. Using 1998 postal rates, a cassette, case and padded envelope could cost \$1.01 to \$1.24 in postage, while a four-minute floppy containing a RealAudio segment runs up a 55- to 78-cent postal bill.

Important but of lesser concern is time. The encoding process takes a few minutes depending on scheme, length of program material and CPU

speed. But when complete, the drag-and-drop dubbing process is faster than any cassette process. A finished diskette can be produced every 30 seconds.

## Keep it simple

The single most important drawback is that the method is too new. Nobody is doing it, at least not yet.

The people in charge of auditioning voice talent — whether for radio or for voice-overs — keep the process simple in the interest of speed. CDs and cassette tapes are industry default standards. More esoteric formats such as DAT, MD and yes, even quarter-inch reel, are ignored, discarded or left on a slush pile to go through "someday." Compressed diskettes are bound to suffer the same ignoble fate.

Decision-makers also want to see if job-seekers can follow directions. If they ask specifically for a tape and you send an MP3 or RA file, you're history.

Setting up a computer to play back a RealAudio or MP3 file can be labor-intensive at best and impossible at worst if the receiving end does not have a player. Machine configurations at the user end may be such that an audition on floppy disk may stutter or fail outright.

During my early tests, the RA encoding process caused "Illegal Operation" flags to appear on my screen, crashing my Cool Edit session. This was resolved when I changed RA encoding settings to the values described earlier.

Whether or not a job can be obtained by this process is a gamble compared to sending a tape or CD-R, but the point is, *technically it can be done*. MP3 and RealAudio are buzzwords for broadcasters and audio pros right now. Forward-thinking jocks or hopeful liner-guys that want their demo to "jump out of the pile" and get attention may wish to try this method to see if it works for them.

Just be careful. The process is built on so much new ground that it may position one as someone ahead of the pack, or could completely eliminate one from the running.

■■■

Gowan Grey can be reached c/o RW.

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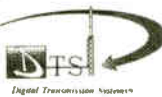
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# Buyer's Guide



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## SPECIAL REPORT

# Make Valid Protection Decisions

Chris Constance

Chris Constance is the electrical engineer for Northern Technologies and an IEEE Surge Protection Device Committee member. Here, Constance provides a case study in radio power protection.

You are the operations manager for a radio station. At 2 a.m., you awaken to that dreaded call: A lightning storm has taken down your entire site.

Once at the station, you assess the damage and find all rectifiers powering essential DC loads have been damaged. You have little battery time remaining when you realize your series protection panel also has been blown and there is no

means of bypass to pass through backup generator power, much less commercial power that has now been restored.

Further, various telephone and communications equipment have been fried. You cannot help but wonder, "How could this have happened and what should I have done differently?"

Countless operations and maintenance managers have been faced with similar situations. It is essential that adequate research and study be done to make informed power-protection decisions.

The first step toward improvement is scheduling a site survey inspecting "as-built" grounding and bonding integrity and site transient preparedness.

Some concern areas of the original

schematic, or one-line, were as follows: the metal oxide varistor (MOV)-based transient voltage suppressor (TVS) installed at the main distribution panel (MDP) for Utility Feed No.1 with about 15 feet of lead-length, a series TVS prior to panel LPB with no means of bypass, small MOV-based devices protecting critical-load Panels LPB and LPC, newly installed Utility Feed No. 2 feeding computers and office equipment and networked computers across the site (feeding outside) were unprotected.

The deficiencies in the transient protection system obviously required attention, but careful consideration had to be given to the site grounding system. Without adequate grounding fundamentals, even the most comprehensive transient protection strategy is undermined.

Grounding at the site had been done in isolated stages. Ground reference points for the tower, separate utility power feeds

and equipment reference buss bars are installed but completely isolated from each other. Further, N-G bonds and other connections to driven ground rods were observed to have been made with partially loose, corroded mechanical clamps with many tight bends in the ground leads.

## Novel ideas

An entire book could be devoted to proper grounding techniques, so only a few major recommendations are listed here. First, the isolation of the separate grounding systems created the possibility for ground loops because the ground path for several systems could be traced to different isolated rods. Additionally, this scenario facilitates potential equipment damage due to uneven ground-potential-rise when a high-energy transient or surge is introduced either on the tower or incoming AC transmission lines.

This situation was remedied by bonding the separate grounding rods and haos together creating a "single-point" ground. This way, when transient energy is introduced at the site and diverted to ground, the site will rise and fall together in

See PROTECTION, page 61 ▶

## USER REPORT

# May I Have Six Kintronic ATU Buildings to Go?

by Greg Urbiel  
Chief Engineer  
WWJ(AM)

**DETROIT** Our sister television station was out to improve its NTSC facility and provide DTV with a new super tower to be built at the existing WWJ(AM) transmitter site.

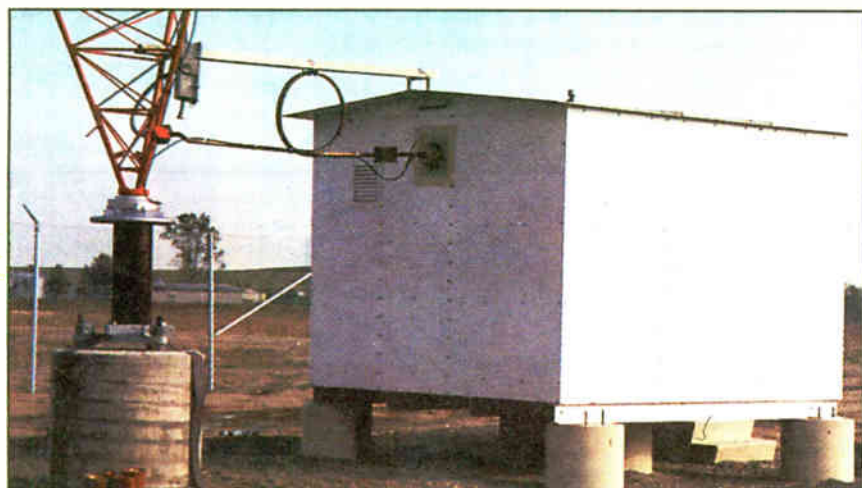
Vendors gathered at an August 1997 meeting to bid on a new turnkey, six-tower directional, 50 kW transmission

before the first ground freeze.

The winning bid came from the team of locally based Broadcast Design and Construction and Kintronic Labs (KTL).

BDC would get the towers up, handle the building and its HVAC and electrical systems, the ground system, and trench and lay coax to the towers.

KTL was responsible for the phasor, array and site controller, dummy load, iso-couplers and the six antenna tuning



The Prefabricated Tuning House for WWJ(AM) in Detroit

site, with separate day and night patterns, located on farmland south of the Detroit metropolitan area.

Reclassifications and approvals pushed our start date and award of contract to late May 1998, with non-directional proofing to begin in September. Directional patterns would have to be "brought in" and all measurements needed to be complete

units. This team promised a working array tuned to theoretical parameters by mid-October.

In a blur, foundations, trenches, cabling and ground system all went in. As the transmitter building and towers were going up, things were just as busy at Kintronic Labs in Bluff City, Tenn.

KTL fabricated our phasor in a five-

See KINTRONICS, page 61 ▶

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## USER REPORT

# Radio Tacuari Upgrades With LBA

by Mauro Guerzoni  
GM, Radio Tacuari  
and Hernan Rodriguez  
Consultant

## MELO, CERRO LARGO, Uruguay

Before describing the experiences Radio Tacuari had upon the installation of its LBA UP-611 Tunipole, it is important to provide an idea of our surroundings, technical equipment and facilities.

Radio Tacuari operates from the city of Melo, capital of the department of Cerro Largo. It is located in northeastern Uruguay, an area enjoying great development in agriculture and cattle ranching. Our station is authorized to operate on 1470 kHz AM at 1 kW. We have an Orban 9200 digital audio processor and a solid-state Sender transmitter. The tower is one-quarter wavelength, upon which we have recently installed an LBA UP-611 Tunipole antenna.

Uruguay is one of the few countries with a 100-percent digital telephone network and complete cellular coverage, and has soundly developed its telephone communications network in recent years. Still, radio remains the dominant means of local communication. It is the only source that covers regional news with the depth that the people require. Broadcasting brings information not only to the populated areas, but also to the isolated rural and cattle ranching areas.

This intimate contact between local radio and the people within its coverage area generates a close relationship between the broadcaster and its audience. Thus, the challenge faced by the broadcaster is to deliver the strong radio signal that its audience deserves and expects.



The LBA ColoPole, Based on the Tunipole

Consequently, field intensity, modulation and quality of broadcasting are also critical aspects for market competition.

Interference with other stations is another crucial concern. Stations on the same or adjacent frequencies with equal or greater power levels can generate interference and noise that corrupts

reception of the intended broadcast message in the desired station's coverage area.

Our case at Radio Tacuari is a particularly critical one, as we only operate with 1 kW. Our goal in using the Tunipole was to provide strong services throughout our region. We needed to radiate each and every watt as authorized in our license. Furthermore, Radio Tacuari had to contend with interference from a 10 kW station about 200 miles away that also was on 1470 kHz.

After we finished the installation and tuning of the Tunipole equipment and put the new signal on the air, we experienced what we might call a revolution at Radio Tacuari. Our phones began ringing, with calls from 100 to 125 miles away. Our coverage area exceeded our expectations.

While our primary objective had been coverage of the Department of Cerro Largo, we ended up totally or partially covering seven departments, over an area of roughly 27,000 square miles. To our great delight, we went from being a local station to a regional radio service.

### Beneficial aspects

We were particularly impressed by the big improvement in sound. Our signal is easier to tune because we improved our bandwidth. Listeners no longer overlook us and confuse Radio Tacuari with distant stations. We also discovered an entire spectrum of midranges and highs that were not audible in our signal before.

The fear of electrical storms we had with our old series-fed insulated tower is gone. Because of the Tunipole antenna, we are able to ground our mast. Our signal is more reliable now as well, because our transmissions are no longer interrupted during a storm.

Other stations in Uruguay have tried to save money by building homemade folded unipoles with unpredictable performance results. Shortcomings of this practice are caused by uncertain quality and reliability of the mounting hardware, and the long-term performance of the system. For instance, the homemade systems do not have adequate tensioning devices, and in a short time the foldwires become loose. This results in erratic transmission performance and impedance changes, depending on which side the wind is blowing.

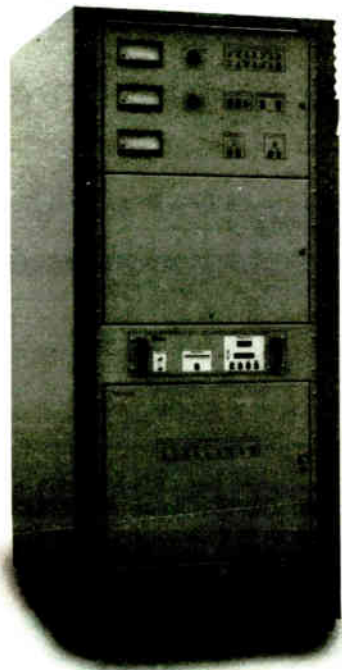
Generally, these homemade unipoles use thin cables not suitable for the transmitted power and lack the shorting ring devices to adjust antenna impedance. This deficiency complicates the tuning process, especially when the tuning unit bridge-measured impedance is not known in advance.

Cost estimates given to us for a homemade clone of the LBA Tunipole were 30 percent lower than buying from LBA Technology. With the risks and critical time factors involved in upgrading Radio Tacuari, we decided to do the right thing from the beginning to insure our upgrade would work the first time. Thanks to the Tunipole UP-611, Radio Tacuari is now a true regional radio station.

For more information contact LBA Technology in North Carolina at (252) 757-0279; fax (252) 752-9155 or circle Reader Service 27.

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## USER REPORT

## Nott Fights Tower Tuning Challenges

by Larry Waggoner  
Broadcast Technical  
Consultant

**WICHITA, Kan.** Your most memorable holiday gift was the new 400-foot tower across the highway from your three-tower DA, in the middle of your major lobe. Now you have started the new year with your critical monitor

offers a line of custom-built detuning assemblies and advice to help solve this type of AM directional terror.

The owner of the new tower — radio, cellular or personal communications — has FCC-mandated responsibilities to protect your directional well-being. Part 22 of commission rules requires "certain precautions" when planning to construct or modify a tow-



Larry Waggoner at the Cellular One Tower in Wichita, Kan.

points showing four to five times the FCC limits.

Fear not. Or should I say "Nott," as in Ron Nott of Nott Limited in Farmington, N.M. This company

er within three kilometers of an AM directional station and one kilometer of a non-directional AM.

These precautions include the cost

See NOTT, page 59 ▶

► NOTT, continued from page 58  
of conducting a partial RF proof-of-performance before and after the tower construction. The tower owner is also responsible for installation and continued maintenance of any detuning apparatus necessary to restore proper performance to the AM station array.

New tower owners might not be aware they are constructing in your backyard. Keep a close, regular watch around your AM site for any new construction. On one project I worked on, the station engineer found a new 400-foot tower halfway completed between his weekly transmitter visits.

I have been involved in the installation and tuning of Nott Limited detuning skirts on everything from 100-foot cell



The KLEY(AM) Unipole/Detuning Skirt

site monopoles to the above-mentioned 400-foot communication tower. Each assembly is custom-made for the tower requirements and AM frequency. The system includes skirt wires, upper and lower mounting brackets, insulated skirt wire download brackets, tuning box and mounting hardware. I have always been pleased with the completeness of each Nott system.

I have only ordered additional parts once, when more of the download brackets were necessary to weave the skirt wires around large dish antennas.

**Rigged up**

My claim of involvement in the installation of many Nott skirts is a bit of an overstatement. The instructions are very complete and easily understood by tower installation crews. I usually return to the site to find the assembly installed and ready for the actual detuning process.

My on-site involvement begins with attaching the skirt wires to the termination box at the base of the tower. The bottom of the skirt may be hot with RF, so it is important to proceed with care. The box contains a vacuum variable capacitor connected in series between the skirt and the tower leg.

Nott selects the value of the capacitor for correct operation of each assembly. There is also an inline pickup unit that converts the skirt AM RF current flow into a DC sample. I prefer to tune the skirt with both the DC sample and Potomac Instruments FIM-41 field-strength meter.

I set the FIM near the base of the tower, broadside to the AM station and inline for maximum indication of the re-radiated tower RF. I always bring an old Simpson 260 VOM to plug into the Nott sample circuit. As resonance is approached, there is a dip in the readings on both the FIM and VOM.

I move the FIM to a point about 100 feet from the tower and make my final adjustment. The FIM reading can be

observed remotely by plugging one end of a long speaker-type cable into the recorder jack.

With the VOM connected at the other end, the reading at the tower base can be observed. Setting the FIM meter switch to the LOG position might save several trips back to change attenuator scale settings.

My use of the field-strength meter along with the Nott sample circuit is a personal preference. I have had the Nott sample disagree with the FIM only once: I was adjusting a three-wire skirt on a 150-foot cell-site pole. Two wires were tuned to the frequency of one nearby AM station and the third wire tuned to a second station.

The single-wire skirt readings on the VOM and FIM dipped at slightly different capacitor settings. I am sure that the actual resonant dip on the Nott sample was masked by RF from the

stronger second station.

Guy wires also are a source of re-radiation. Your consulting engineer can direct you in breaking up the electrical length with insulators. The detuning skirt is of no value if guy wire problems are not addressed first.

The only serious problem I have experienced with wire-type detuning skirts is when the wire blows in the wind and touches an antenna close by. This problem can be addressed during installation with additional insulated standoff downlead brackets. Careful routing of the skirt wires around obstacles is also important.

Ron Nott has been helpful in providing telephone assistance before and after the sale. I didn't wear out my welcome with Nott even during the installation, adjustment and licensing of a combination folded unipole feed and

detuning assembly. This special unit was installed on a replacement tall tower, which was an active part of a directional array.

Nott Limited also manufactures folded unipole feeds. If you are an Amateur HF mobile operator, you will be interested in the company's all-band, remote motorized tuning antenna to mount on the station engineering vehicle.

I have found the Nott Limited detuning skirt assemblies to be a cost-effective, easily installed, easily adjusted and proven method of solving tower re-radiation problems. The bottom line is that they work. It is always quite satisfying to see the monitor points return to normal.

For information contact Nott Limited in New Mexico at (505) 327-5646; Web site [www.tjantenna.com](http://www.tjantenna.com) or circle Reader Service 1.

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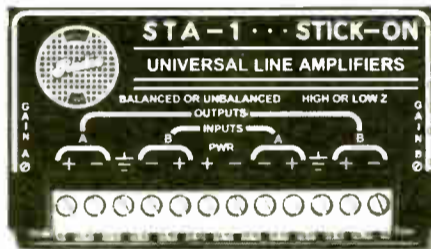
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READER SERVICE NO. 128

## Solid ATU Buildings For WWJ

► KINTRONICS, continued from page 57 bay cabinet. Out in the company parking lot, six ATU buildings to house tower-matching networks and lighting controllers were fabricated from the ground up.

Each weatherproof 12-by-9.5-by-8-foot enclosure has a 7-foot interior height. They are aluminum framed with thermal insulation placed in the roof, walls and floor. A thick aluminum roof serves as an ice shield.

Filtered, unpowered ventilation and thermostatically controlled baseboard heaters provide stable environmental conditions during Michigan's seasonal weather changes. Coax, control and power cabling come up into the buildings through floor-mounted insulated bushings.

### Big and brawny

Each ATU building has a keylocked front steel door along with a suitably sized door-opener, preventing one loaded down with test gear from getting knocked down in the wind. Inside is a screened and shielded entry area, where all non-RF components such as AC disconnects and breaker panels, ATU power circuits and tower lighting controllers are located.

Routine antenna current readings are taken with a Delta toroidal base current meter mounted in a grille opening separating the protected area from the business side of the ATU. Interlocks allows entry to the matching network components, j-plugs and contactors. Overhead lighting and AC power receptacles are abundant.

The construction of the networks is top-notch. The hardware is stainless; the tubing bends clean and well-thought out. Exposed end threads are capped with acorn nuts. Lock and flat washers abound. This is good stuff.

Four equally spaced aluminum I-beams run the length of the bottom of each ATU building. These beams form a rugged mounting mechanism with the six building footing piers.

The piers keep the buildings two feet above the ground. The site is in the 500-year flood plain of Lake Erie, and Michigan winters can bring copious amounts of snow. High-traction fiberglass stairs are mounted at the entrance doors.

The ATU buildings arrived in a "just-in-time" fashion. As each tower was stacked to completion, an ATU building would arrive and be lifted by crane and guided onto the piers.

With everything in place, Ron Rackley, of duTreil, Lundin and Rackley, adjusted the array to theoretical values on the antenna monitor. Because the phasor and ATU networks had been pretuned at Kintronic Labs, we came out ahead of schedule.

For more information contact Kintronic Labs in Tennessee at (423) 878-3141; fax (423) 878-4224 or circle Reader Service 109.

## Providing Protection for Your Station

► PROTECTION, continued from page 57 potential. Further recommendations involved guaranteeing that ground bonds were made in a way to support long-term integrity; exothermic welds or compression clamps were used for critical bonds to driven rods. mechanical clamps were treated with non-oxidizing lubricants and made with double-bolt lugs to prevent loosening and all ground connections were made with large, straight conductors to minimize circuit resistance.

Figure 1 shows the "single-point" grounding philosophy implemented.

It was discovered that the series TVS device and the small hard-wired MOV units had sacrificed. The front-end "brute-

force" MOV unit off of the MDP had not been damaged at all, however. Even with so-called "adequate" protectors in place, better choices could have been made regarding technology used and installation to increase site survivability.

A popular configuration for a transient suppression device or system is to electrically place it in parallel with the critical system or equipment it protects.

This scenario provides an unobtrusive means for the suppressor to influence the let-through voltage seen by the downline load without the possibility of leaving that load without power if the suppressor sacrifices, as in the case of a series protector which at the station had no means of bypass.

Under conditions where the voltage is within safe operating tolerances for vital equipment, the parallel suppressor remains in a high-impedance state which restricts the flow of any current through the device.

When the voltage varies outside safe levels (usually 25 percent above the nominal peak voltage), the device will change to a very low-impedance state, and divert the harmful transient energy away from the sensitive downline load for the duration of the overvoltage condition.

For adequate protection of extremely sensitive solid-state devices, the most critical element is to limit the above-nominal voltage seen across their terminals, often

See PROTECTION, page 65 ►



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## TECHNOLOGY UPDATES

### Warner Electric

The WHR Series from Warner Electric is an extensive line of voltage regulators designed for AC power sys-



tems up to 660 VAC and is suited for several broadcast applications requiring protection, including transmission.

Manufactured under the Stabiline trademark, the regulators in the WHR Series maintain constant voltage to sensitive electronic and electrical systems — even when the input voltage and system load vary widely. Models range in power rating from 2 to 1,680 kVA.

which hold output voltage to  $\pm 1$  percent and a typical efficiency of 99 percent. Waveform distortion and power factor restrictions are nil.

An all-buck, or all-boost capability is featured, as are two voltage ratings and shifted input ranges for greater low-

voltage protection. Numerous standard options are also available: analog or digital control, zigzag neutral generation, single or individual phase control and tropical environmental treatment are among the choices.

For more information contact Warner Electric in Connecticut at (860) 585-4500; fax (860) 584-1483 or circle Reader Service 105.

### Cortana

Cortana offers the Stati-Cat lightning prevention system for protection against tower and equipment damage and potential loss of air time.

The Stati-Cat system works through the principle of charge dissipation. It provides an uninterrupted, low-resistance discharge path for the static electric charge present on tall structures. The system reduces the high-voltage gradient between clouds and the tower that can lead to lightning strikes.

Several components comprise the Stati-Cat product line. Two such exam-

ples are the CN-1 Crow's Nest, designed to protect the top section of a tower from lightning strikes and the Stati-Kitty SC-3, which reduces noise in receiver antennas and attaches to a tower guy wire.

According to the company, all Stati-Cat components are made of aluminum and high-temperature stainless steel, and should enjoy a life as long as the tower and antenna. Up to four Stati-Cats can be installed in place of the mounting bolts of a standard tower beacon.

For more information contact Cortana in New Mexico at (505) 325-5336; fax (505) 326-2337 or circle Reader Service 157.



### Litton Life Support

Litton Life Support offers the InstaGas nitrogen concentrators for remote radio broadcast tower stations.

The company uses pressure swing absorption (PSA) technology to make the concentrators, which produce nitrogen and oxygen around transmission equipment.

The company offers three types of turnkey InstaGas systems. If compressed air is not readily available, an 11, 22 or 42 scfh InstaGas system comes equipped with its own compressed air source. If compressed air is available, four separate systems will concentrate either 11, 21, 31 or 42 scfh of nitrogen.

Each turnkey system includes an

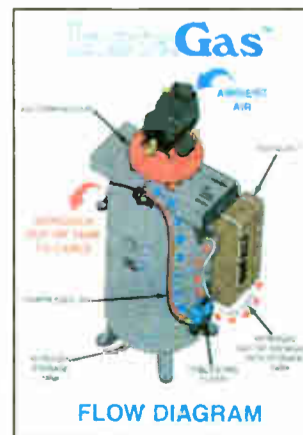
InstaGas PSA concentrator; a ceramic oxygen switch for proper operation, a regulator for plenum output pressure and a storage plenum selected to match the user's application. The

InstaGas system maintains the plenum pressure between 40 and 50 pounds per square inch gauge (psig); a second pressure switch is set at 30 psig to provide a switch closure that alerts the engineer of power interruption or a major increase in flow.

The InstaGas system must be located in a well-ventilated area, with a temperature between 38 and 104

degrees Fahrenheit.

For more information contact Litton Life Support in Iowa at (800) 553-1860 or circle Reader Service 183.

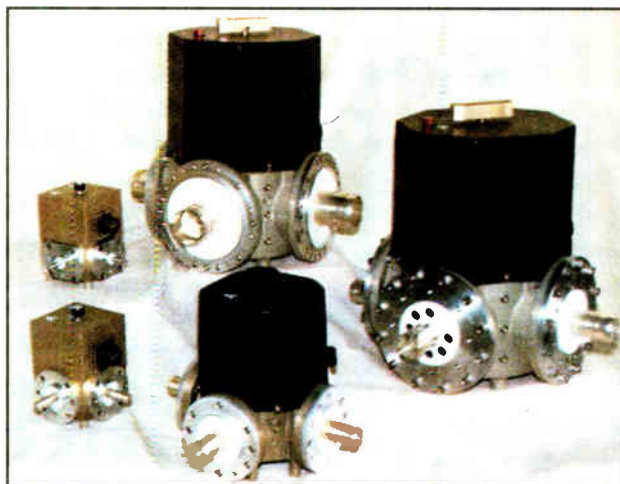




## TECHNOLOGY UPDATES

## Micro Communications

MCI coaxial transfer switches from **Micro Communications** are four-part transfer switches that can



switch two signal sources between loads. They can also be used as SPDT switches, so complex switching matrices can be assembled.

According to the company, the coplanar port configuration of the

switches is a unique feature, providing neater, more compact layouts in most installations, and requires fewer elbows. Usually one-half to one-third the weight of other switches, they occupy a marginal amount of space.

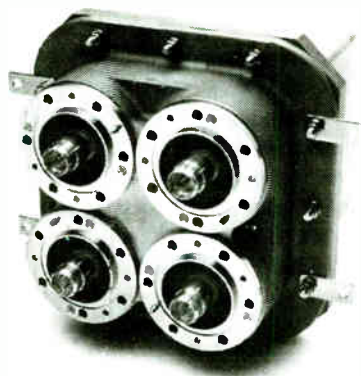
Each switch incorporates independent interlock/logic circuits for transmitter blanking, logic input or position indication. Internal interlocks are also included for removal of drive power at the end of the switching cycle to avoid drive motor damage.

Action is accomplished with a standard high-torque gear motor and is bi-directional to positive stops. If control power is lost, the switches can be operated manually.

For more information contact **Micro Communications in New Hampshire** at (603) 624-4351; fax (603) 624-4822 or circle **Reader Service 2**.

## Delta Electronics

The Model 6740B and Model 6742B coaxial transfer switches from **Delta Electronics** are double-pole, double-throw high-power switches for use with



3-1/8 inch, 50-Ohm transmission line.

The switches, which can be operated both manually and remotely, alter coaxial connections with little

changeover or off-air time, with transmission line switching taking less than two seconds. Model 6740B operates with 120 VAC, 50/60 Hz main power; Model 6742B works with 220/240 VAC and 50/60 Hz main power.

Both switches can be pressurized up to 15 psi. Each terminal has a built-in gas barrier, and an air inlet port is provided for each model. Two isolated interlock circuits for each switch connection duplicate the RF path exactly. All interlock switches open before the RF contacts open, and close after the RF contacts seal to prevent switching with RF power applied.

Additional internal switch contacts allow remote control and status indication. All interlock, indicator and control circuits interface the transfer switch through a connector.

For more information, contact **Delta Electronics in Virginia** at (703) 354-3350; fax (703) 354-0216 or circle **Reader Service 106**.

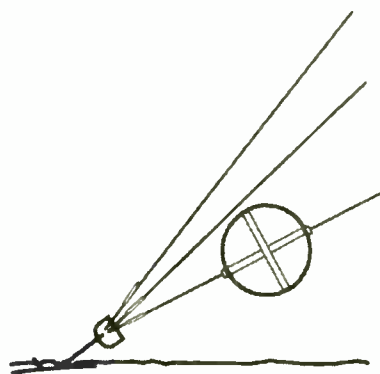
## ID-ER Antenna Products

**ID-ER Antenna Products** offers its Guy Wire ID Marker Balls for prevention of accidents related to radio broadcast towers. They help avoid machinery and prevent unaware personnel from striking or running into guy wires and anchors.

The 12-inch marker balls are installed on the lowest wires of a guyed tower by tightly wrapping black strip-bushing at both ends and applying tape to hold the bushing in place. A strap holds the lower half of the ball to a guy wire while bolting together the upper half. The halves are then bolted together using supplied black nylon hardware and two washers.

The ID marker balls are constructed of a heavyweight, reinforced fiberglass plastic with a weather-resistant orange gel coating. Night-reflective, white

industrial tape is applied in a cross pattern. The black rubber-strip bushing adjusts to fit guy wires up to 3/4-inch in diameter.



For more information call or fax **ID-ER Antenna Products in Pennsylvania** at (610) 458-8418 or circle **Reader Service 132**.

## Systems With Reliability

The digital-compatible "K"-Line transmission line from **Systems With Reliability** transfers digitally generated signals, with no electrical disturbances, smoothly along its path. According to the company, it is reliable enough to never have to be replaced.

The line features a heavy wall inner conductor, with a fast heat flow due to the thermocoupled inner conductor. There is no finger bullet — a watchband spring offers only one joint per section of line. Normal-wear dust is collected in a



cup instead of on the insulator.

Sections of the transmission line can be cut to the user's needs, and supported reinforced elbows — 45 or 90 degrees — can be matched to the user's system.

Heavy-duty spring hangers are supplied for both vertical and horizontal runs, and fixed hangers secure the top of the vertical run and the elbow complex. A fail-safe gas barrier is also provided, as are two end caps for temporary closing of the line.

For more information contact **Systems With Reliability in Pennsylvania** at (814) 472-

5436; fax (814) 472-5552 or circle **Reader Service 28**.

## Econco

**Econco**, which recently acquired **Vacuum Tube Industries**, is a large independent manufacturer of rebuilt electron vacuum tubes. The recent acquisition doubles the company's manufacturing capability.

Vacuum Tube Industries brings the CQK 650-1, a 500 kW shortwave radio tube, to the existing Econco A.B.B. product line, which includes the CQS 200-3, the CQS and CQK 50s and the CQS and CQK 25s.

The combined staff of **Econco-V.T.I.** will also continue to work on newer products, particularly the Thomson TH 558 and the Siemens YL 1490, both 500 kW shortwave radio tubes. Other tubes are expected to be introduced later in the year; initial tube types will center around the Eimac product line, with the first tube being the 3CX15.000A7.

For more information contact **Econco in California** at (530) 662-7553; fax (530) 666-7760 or circle **Reader Service 54**.

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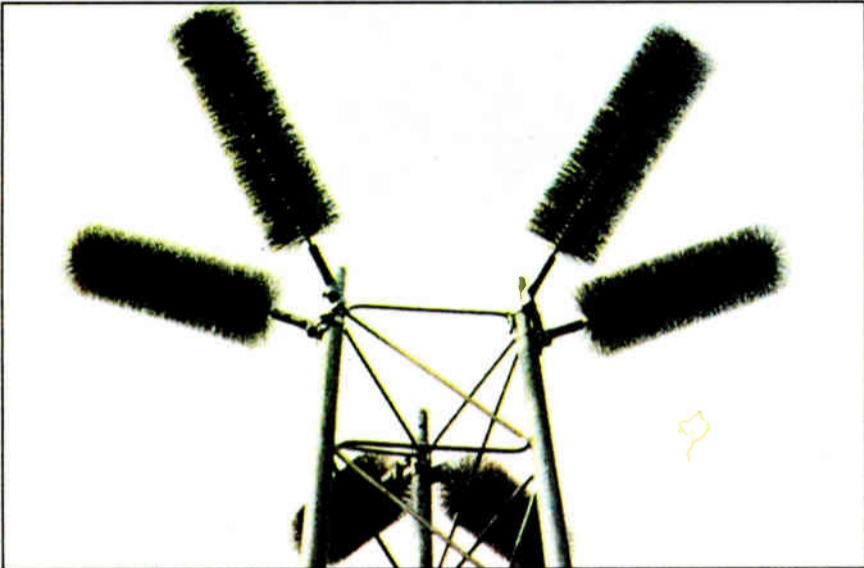
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**TECHNOLOGY UPDATES**

**Lightning Deterrent Corp.**

The Lightning and Static Deterrent systems from **Lightning Deterrent Corp.** are comprised of thousands of points of stainless steel arranged in various configurations. According to



the company, the systems are successful on structures of all types in virtually any environment.

The systems have the flexibility of design to enable varying lengths and length of bristle. A single unit comes with a leg mount and three elements of bristles, each weighing about three pounds. The double unit features six elements of bristles, each weighing

six pounds.

The Lightning Deterrent systems protect a structure by deflecting lightning from the building, thereby preventing damage to the structure and equipment inside. A positively charged corona is formed, deterring positive lightning energy and static buildup.

The units are made of non-corro-

sive stainless steel and galvanized mounting materials. According to the company, they have been known to withstand winds of 235 mph, as was the case with Hurricane Hugo. Wind load effect is minimal.

For more information contact **Lightning Deterrent Corp.** in Illinois at (800) 776-7150; fax (815) 458-3057 or circle **Reader Service 158.**

**Freeland Products**

**Freeland Products** manufactures rebuilt power tubes for the radio industry. The company offers several models of triodes, tetrodes/pentodes and tetrodes, as well as several miscellaneous models.

Rebuilt or reprocessed tubes are guaranteed against defects in materials and workmanship for up to 3,000 hours or one year. Mechanical damage, open filaments under certain conditions, cracked ceramic or glass, glass punctures from cathode rays and damage from improper operating conditions are cov-



ered in the warranty, as well as loss of vacuum due to bad contact at tube connectors.

The company will appraise for rebuilding tube types which do not appear on its price list. Tube specifications can be faxed in advance for review.

Additionally, the company encourages engineers who do not use rebuilt tubes to send expired tubes to its headquarters for purchasing considerations.

For more information contact **Freeland Products** in Louisiana at (800) 624-7626; fax (504) 892-7323 or circle **Reader Service 184.**

**RFS Broadcast**

**RFS Broadcast** manufactures a range of constant impedance adjacent channel combiners for transmission support, including models CU31C6XA and CUW115E4XA31.

Both models allow digital and analog services to operate from one antenna through adjacent channel combining, maintaining a constant signal-strength ratio throughout the service area. Operation from a single antenna minimizes the competition for premium locations on a tower.

The combiners are characterized by a range of cross-coupled filters and high-

directivity hybrids in both coaxial and waveguide versions. Available in compact sizes, both models feature high isolation between inputs and are available in 6, 7 and 8 MHz channel bandwidths. They can be cascaded for multichannel operation and custom designed to fit the needs of the user.

The company also offers Flexwell transmission line, pressurization equipment and transmitter and antenna switching units for flexibility in configuration of patching arrangements.

For more information contact **RFS Broadcast** in Connecticut at (203) 630-3311; fax (203) 239-9260; or circle **Reader Service 135.**

**Electro Impulse Lab**

**Electro Impulse Lab** offers several dry FM loads, including models DPTC-25KFM, DPTC-50KFM and DPTC-75KFM.

All models have an operational frequency of 110 MHz and a VSWR of 1.15:1. Positioning of all units is upright with operational ambient temperatures of -40 to 45 degrees Celsius. Each model is interlocked for line power, air flow and overtemperature. A reject load option is

available for each unit.

Each model has differences in power and weight: The DPTC-25KFM has a power rating of 25 continuous kW and a weight of 92 pounds, the DPTC-50KFM has a power rating of 55 continuous kW and weighs 115 pounds, the DPTC-75KFM has a power rating of 75 continuous kW and weighs 198 pounds.

For more information contact **Electro Impulse Lab** in New Jersey at (732) 776-5800; fax (732) 776-6793 or circle **Reader Service 162.**

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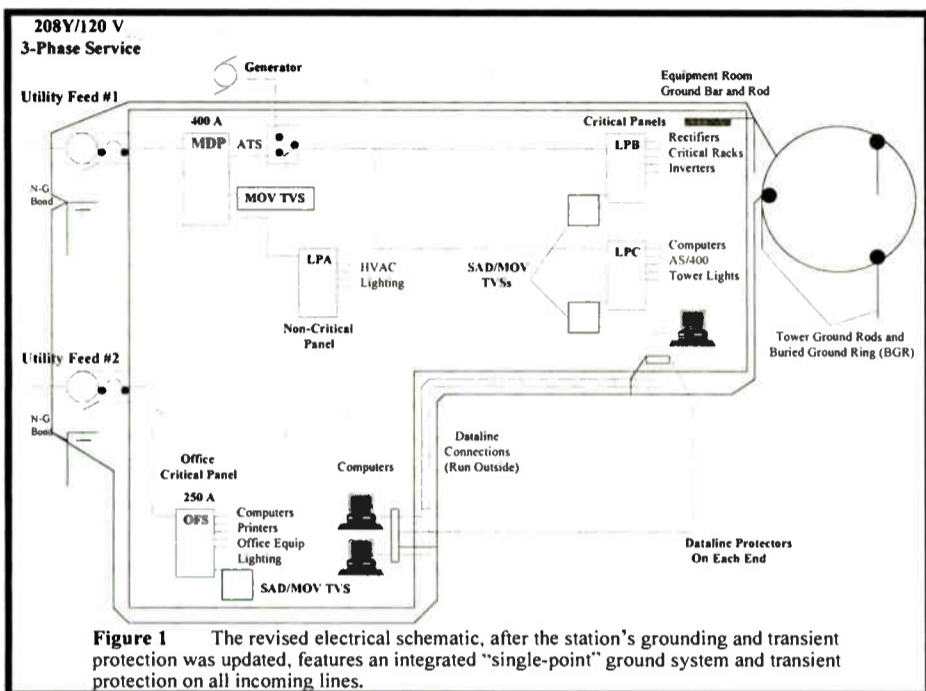
# Clean Power Protection

► PROTECTION, continued from page 61 called "let-through" voltage. This value characterizes the suppressor performance and yields its UL 1449 rating under specific testing conditions. The most determinant factors for favorable let-through voltage values are suppression technology utilized and method of installation.

Two popular technologies used in AC power TVS devices are MOVs and Silicon Avalanche Diodes (SADs). Each has its own characteristic impedance while conducting transient current. Though these resistances are quite small, when multi-

In regards to installation, resistive components of the parallel connection path such as wires and connection hardware may play even a larger role than the resistance of the technology.

This explains why the MOV device at the station had not sacrificed even when downline equipment had. The overall turn-on voltage for the suppressor was dramatically increased because of the  $V = IR$  effects of the 15-odd feet of lead-length. Consequently, it barely responded to the incoming surge while letting through hundreds of volts of damaging energy.



**Figure 1** The revised electrical schematic, after the station's grounding and transient protection was updated, features an integrated "single-point" ground system and transient protection on all incoming lines.

plied by the tremendous amount of current typical of a lightning event — 3 to 10 kA — the effects can be catastrophic.

Referencing Ohm's Law ( $V = IR$ ), the larger the  $R$ , the larger the let-through voltage and the greater the potential for equipment damage. Industry standard test results show SADs exhibit much lower resistances during transient events and yield superior let-through voltages.

When it comes to sensitive equipment protection, every volt counts; choosing a primary technology with minimal residual voltage is essential.

Because they are relatively inexpensive on an energy-rating basis, however, MOVs serve as an excellent backup stage in TVS designs. Further, as is commonly known, MOVs degrade with current flow. Lifetime ratings can be obtained from MOV manufacturers showing expected longevity based on amplitudes and durations of applied transient waveshapes.

SADs, on the other hand, will operate indefinitely, provided its energy ratings are not exceeding by an incoming pulse. Consideration to system vulnerability and exposure levels must be accounted for to make adequate recommendations.

An effective strategy for many larger installations is to have a multi-layered approach for protection. This means to place a "brute-force" MOV-based device near the AC service entrance, where less-sensitive motorized loads are located that do not require the same tight clamping characteristics as vulnerable downline equipment. For those locations, TVS devices utilizing SAD technology are required.

Further, this approach allows the front-line protectors to knock down a potentially catastrophic incoming lightning transient to allow subsequent SAD primary suppressors to clean up the residual disturbance.

This approach was employed at the station (Figure 1) and has proven very effective. Each protection system should be engineered on a case-by-case basis to guarantee recommendations account for all vulnerabilities and variations.

Comprehensive site protection must take into account every possible entry point for harmful transient energy. The AC and telephone utility lines are the most obvious "front doors" to the outside world. Data lines connecting LANs, printers or other peripheral equipment which may connect co-located structures or have exterior runs of cable may

for imbalances at the input ports.

According to the company, the E Star will provide fault tolerance that hybrid combiners are unable to achieve, when utilized with solid-state and/or tube transmitters and when one or more power amplifiers should go off line. The symmetrical port isolation of the E Star automatically handles input faults without affecting output or adjacent input port match.

For more information contact Myat in New Jersey at (201) 767-5380; fax (201) 767-4147 or circle Reader Service 29.

be a back door for transient energy.

Data line protection devices were therefore placed on both ends of cables connecting computer equipment, again shown in Figure 1.


All sensitive systems at the site have enjoyed comprehensive protection since the audit recommendations were followed. Periodic maintenance or replacing modules may be required, but these items are easy to replace compared to the monetary investments of network infrastructure and lost revenues — not to mention an even more critical asset: the trust and confidence of customers and advertisers.

Goals of assuring adequate power quality and sufficient transient preparedness are well worth the time and monetary investments. As solid grounding fundamentals are the foundation upon which


subsequent power-protection strategies must be constructed, careful consideration must be given to make that foundation sound — otherwise the entire structure will be undermined.

Lightning and transient protection fundamentals should focus on limiting let-through voltage seen by sensitive loads. This is accomplished by utilizing the best performing technology and installing it in a way to optimize its performance. Attention should be given to protect every possible entry point for transient energy. Most manufacturers of TVS equipment should serve as resources for providing site audits and custom engineering solutions for total site protection.

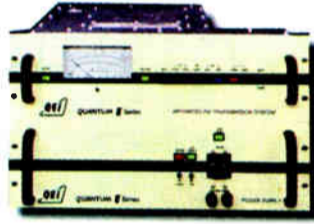
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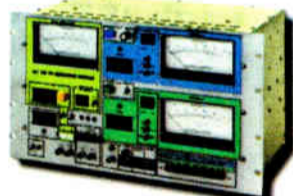
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### TECHNOLOGY UPDATE

#### Myat

Myat manufactures the E Star N-Way common frequency power combiner for achievement of desired power levels on parallel transmitters as well as a degree of fault tolerance.

The E Star N-Way combiner is characterized by low insertion loss, high isolation between output ports, matched conditions at all ports, external high power load resistors and monitoring capabilities

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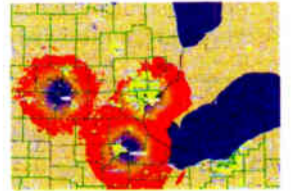
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8	Arrakis	3	60	J Squared Technical Service	70
37	Arrakis	194	54	JK Audio	19
21	ATI	104	22	Kintronic Labs	234
51	Audio Broadcast Group	66	10	Knights Communications Inc	230
49	Audio Precision	32	41	Logitek	75
2	Audioarts Engineering	49	21	LPB	52
54	Autogram Corporation	98	17	Lucent Technologies	216
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21	Benchmark Media Systems	130	52	Microwave Filter Co.	23
6	Bext	50	58	Nautel	168
52	Boston Financial & Equity	59	27	Netia	42
55	Bradley Broadcast	48	32	OMB America	8
21	Broadcast Devices, Inc.	26	38	Orban	165
63	Broadcast Richmond	160	42	PR&E	57
16	Broadcast Software Int'l (BSI)	160	57	Pristine Systems	147
54	Broadcast Tools	100	59	Pristine Systems	190
18	BSW	53	54	Propagation Systems	99
4	Burk Technology	209	31	Prophet Systems	21
21	Circuit Werkes	24	52	PTEK	102
52	Circuit Werkes	76	65	QEI	116
54	Coaxial Dynamics, Inc.	20	60	Radio Design Labs	43
7	Comrex	80	64	Radio Frequency System (RFS)	227
1	Continental Electronics	118	19	Radio Systems	140
21	Cortana	77	12	RadioSoft	97
30	Crown Broadcast	78	28	Register Data Systems	220
13	Cutting Edge	187	34	Scott Studios	122
52	Davicom Technologies	55	54	Shively Labs	47
26	Denon Electronics	46	15	Shure Brothers, Inc.	110
36	Dick Brescia Associates	131	54	Silicon Valley Power	74
43	Dick Brescia Associates	199	45	Sonic Foundry	101
44	Dick Brescia Associates	91	60	Spacewise Broadcast Furniture	95
3	Digram	173	52	Studio Technology	103
60	Econco	44	39	Superior Broadcast Products	188
60	Electronic Research Inc.	128	56	SWR	212
33	Enco Systems	175	46	Syntrillium Software	82
29	Eventide	30	39	Technology for Communications	72
54	Excalibur Electronics	73	9	Telos Systems	63
52	Freeland Products, Inc.	22	61	Warner Electric	89
48	Gentner	111	64	Weatheradio	126
36	Ghostwriters	96	28	Webster Audio Products	14
60	Global Data Inc.	17	71	Wheatstone	58
21	Gorman-Redlich Mfg. Co.	51	72	Wheatstone	84
35	Harris	18	23	Whirlwind	144

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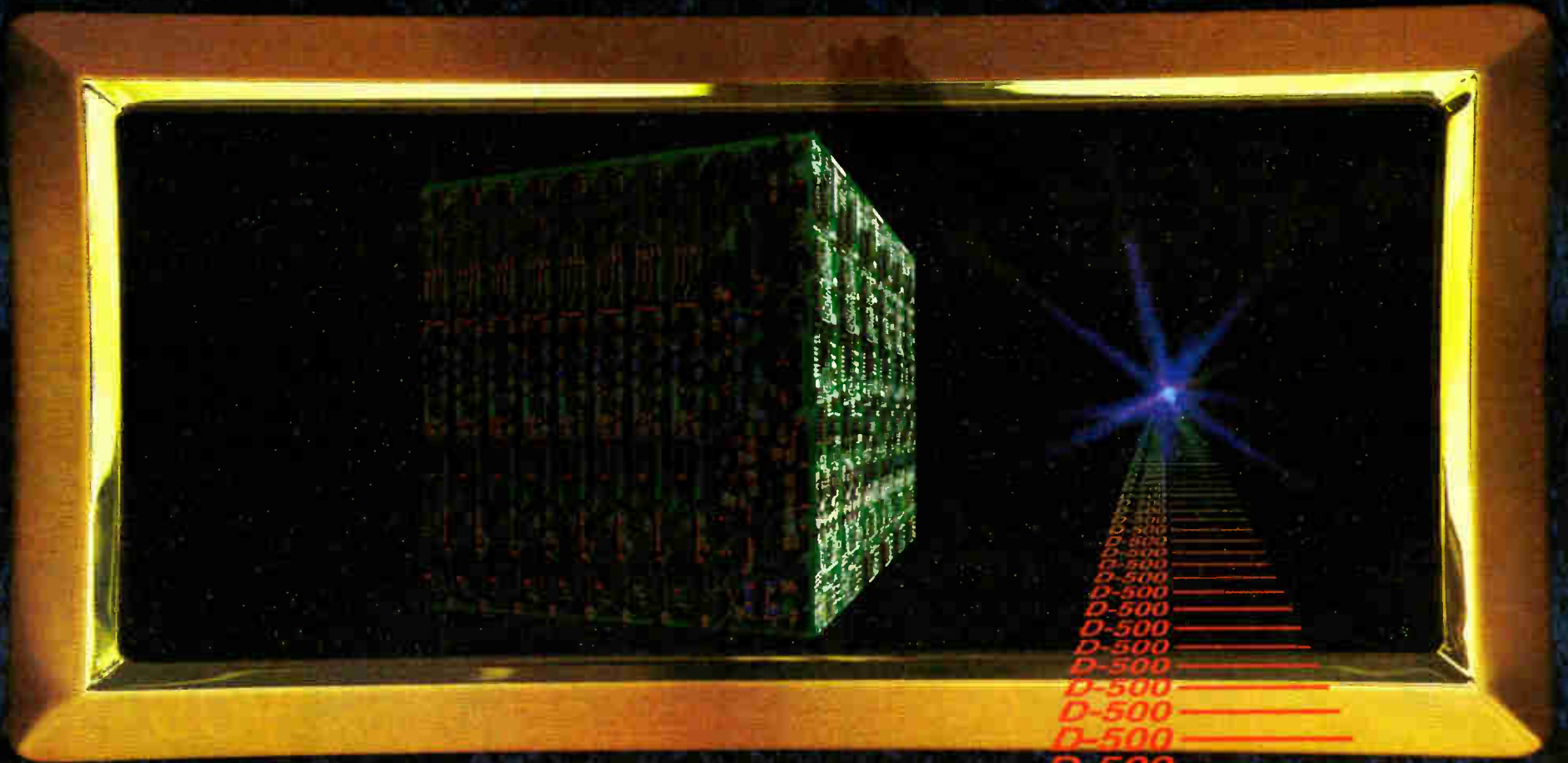
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