

Radio World®



Tubes Are Hot!
See Page 42

Vol 21, No 4

Radio's Best Read Newspaper

February 19, 1997

EIA Draft Angers DAB Proponents

by Matt Spangler

LAS VEGAS Testing of digital audio radio systems by the EIA in the United States concluded last month, but the nation's broadcasters are no closer to a standard than when testing began.

IBOC, IBAC and satellite DAB proponents once again protested the presentation of test results by the Consumer Electronics Manufacturers Association (a division of EIA), which released the results last month at a CEMA DAR subcommittee meeting. Once again, proponents accuse the CEMA testing process and reporting of results as slanted in favor of the European-based Eureka-147 DAB consortium, many of whose founding partners are dues-paying members of the EIA.

The Federal Communications Commission was awaiting a recommendation for a DAR standard based on the subcommittee's evaluation of the systems.

The draft report released at the meeting, titled "Technical Evaluations of Digital Audio Radio Systems Performance" and dated January 1997, evaluates the performance of in-band, on-channel (IBOC) DAR systems from USADR and AT&T/Lucent Technologies/Amati Communications, AT&T/Lucent's in-band, adjacent-channel (IBAC) system, the Voice of America/Jet Propulsion Laboratories satellite system and the Eureka-147 DAB L-band (digital audio broadcasting) system.

The report was handed out to attendees without explanation, according to

Don Messer, broadcast satellite program manager of the VOA Bureau of Broadcasting/Engineering Telecommunications, and the author was unidentified.

Although both the AT&T and the USADR IBOC systems were withdrawn from the San Francisco field tests — before they began — the report includes data on those IBOC systems. USADR had disputed the methodologies of the subcommittees of the EIA and the NRSC conducting the tests, while AT&T could not find a station willing to test the digital system.

In light of the withdrawal of the IBOC proponents from the EIA testing process and their dissatisfaction with the entire process, the

National Association of Broadcasters has offered to steer the DAB standard selection process for U.S. broadcasters.

Messer's main criticism of the testing was the lack of indoor measurement of the systems. In a Jan. 14 letter to Randy Bruntz, chairman of the EIA DAR subcommittee, Messer wrote, "Car and truck reception is not the only way people listen to radios, particularly if CD quality is one of the important criteria."

See DAR, page 13 ▶

FCC Thinks About What You Owe Them

by Matt Spangler

WASHINGTON On the Federal Communications Commission agenda for 1997 is a reconsideration of the regulatory fee schedule for broadcasters. Two new proposals, from the National Association of Broadcasters and the Montana Broadcasters Association, suggest that the fees should be levied based on the size of the population that a station serves.

Congress has required that the FCC

mitted a proposal to the FCC that would base the radio fee schedule on one for television signed into law by President Clinton in "The Balanced Budget Downpayment Act" of 1996. In the

See FEES, page 11 ▶

TV host Wink Martindale is rooted in radio.
See Page 47



Congress has required that the FCC

Eighteen state associations filed reply comments with the FCC.

collect roughly \$150 million of its \$190 million FY 1997 budget from regulatory fees. These fees are designed to offset "the annual costs of its enforcement, policy and rulemaking, user information and international activities," according to the Telecommunications Act of 1996.

Currently, AM stations pay \$345 (Class D) to \$1,250 (Class A) annually, while FM stations pay \$830 (A, B1 and C3) or \$1,250 (C, C1, C2 and B). MBA has pointed out that a Class B FM in New York, with a 1994 population of 7,733,253, pays the same fees as a Class C FM in Red Lodge, Mont., with a 1994 population of 2,280.

The Montana association last fall sub-

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NEWS ANALYSIS

Oregon ID Case Raises Questions

by Harry Cole

WASHINGTON A recent decision by the FCC Mass Media Bureau may force all broadcasters to take additional steps to assure compliance with the commission sponsorship ID rules. In an action that drew relatively little public attention, the bureau concluded in October that an organization that purchased time on a number of Oregon broadcast stations to oppose a ballot proposition was not the true "sponsor" for sponsorship identification purposes.

In the Oregon case, the spots had been bought by the Fairness Matters to Oregonians Committee, or FMOC. The spots opposed a ballot proposition that would impose increased taxes on tobacco products, including cigarettes. FMOC was a bona fide political committee registered with Oregon, and the stations

See IDS, page 10 ▶

NEWSWATCH

Simon Leaving White House

WASHINGTON Greg Simon, Vice President Gore's chief domestic policy adviser and a key player in the passage of the Telecommunications Act, will leave the White House this month.

A White House spokeswoman said Simon will be heading to the private sector, although at press time she said Simon had not said where he was going.

Simon, who was instrumental in mediating deals between the major entities involved in the implementation of the act, will not take up any new communications issues in his last month in the White House. Instead he will focus on his next moves. The spokeswoman said that

any rumors of a meeting between Simon and the NAB on the subject of Justice Department antitrust investigations were unfounded.

Meanwhile, Kathleen Wallman, former chief of the FCC Common Carrier Bureau, was appointed chief of staff of the National Economics Council. She is expected to help shape Gore's communications policies.

NPR Stations 'Polarized' By Satellite Failure

WASHINGTON On Jan. 11, the AT&T Telstar 401 satellite suffered a complete loss of service, sending many users, including PBS, scrambling to

restore service by utilizing other satellites. One of the displaced video services was relocated to transponder 2 on Galaxy 4, a satellite used by public radio. This created interference in the downlink antennas had not been properly polarized, according to National Public Radio's Jim McEachern.

"This is something Hughes had been working towards anyway," McEachern said, "it just happened a little faster than anybody expected ... It certainly gives you pause for thought."

McEachern said January's severe weather conditions in the Midwest made polarization of the antennas difficult for some stations.

The cause of the satellite failure had not been determined.

FCC Strengthens Ties With State and Local Governments

WASHINGTON FCC Chairman Reed Hundt announced last month the formation of the Local and State Government Advisory Committee. This committee is to be made up of elected officials of state and local governments or their representatives plus one representative from the FCC. It will advise the commission on matters concerning their constituencies, including public rights-of-way, facilities siting and removal of barriers to entry.

The committee will meet in facilities provided by the FCC at least three times a year, and will consist of no more than

See NEWSWATCH, page 3 ▶

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Index

FEATURES

- Safety Is Well Worth the Cost**
by Troy Conner 19
- Put Your Older FM Transmitter to Work**
by James F. Pinkham 19
- Use the Proper AM Hardware**
by W. C. Alexander 20
- Become an Israeli Media Mogul**
by Lee Harris 21
- Hear the Sound of Capacitors**
by Jim Somich 22
- Farm Field Is Fertile Ground for Radio**
by Dee McVicker 25
- A Computer Network Case Study**
by Lynn Meadows 29

STUDIO SESSIONS

- Focusrite Is Clean and Green**
by Ty Ford 31
- Furman Cures Warts**
by Alan R. Peterson 35
- Nagra Goes Digital With ARES-C**
by Rich Rarey 36
- Canadian News Depends on Dalet**
by Mel Lambert 38
- Self-Powered Teleporter Needs No Batteries**
by Alan R. Peterson 38
- Radio Gets the Glow With Tubes**
by John W. Diamantis 42
- Vacuum Tubes: New Glory Days Are Here**
by Alan R. Peterson 43
- Keeping Busy in Small Markets**
by Sallie Schneider Sauber 43
- Musical Cheers for Engineers**
by Alan R. Peterson 44
- Korg RM8 Speakers 'Highly Useful'**
by Bruce Bartlett with Jenny Bartlett 46

RUNNING RADIO

- Through the Years With Wink**
by Alan Haber 47
- Traits of FM Radio Waves**
by Ed Montgomery 47
- Are You Truman, or Hitler?**
by Sue Jones 48
- Survival: Canadian Case Studies**
by James Careless 53
- Reset Your Station Hot Clock**
by Mark Lapidus 56

Hard Charges on Hard Liquor

by Bob Rusk

WASHINGTON A leading African-American broadcaster says it is racist to assume that minority-owned radio stations are economically disadvantaged and are being sought out by hard liquor advertisers.

Chris Bennett, president and CEO of Seattle-based Chris Bennett Broadcasting, refutes statements made by the Center for Science in the Public Interest.

George Hacker, director of CSPI's Alcohol Policies Project, stated, "Since minority-owned and minority-targeted radio stations are much more hard up for revenue than other stations, they have become a natural target for hard liquor marketers."

In response, Bennett, who owns urban format stations in Seattle and Portland, Ore., said, "That is a racist statement. How have we kept our doors open this long without that type of advertising?"

Hacker defended himself, saying, "Minority broadcasters have testified before Congress that they are more dependent on beer advertising than other

broadcasters because of the lack of other advertisers."

Case-by-case

The liquor industry began airing commercials on radio and television last year, lifting a 60-year self-imposed ban. Bennett said his stations do not air hard liquor spots and have not been approached by the liquor companies. As a result, he has not developed a policy on such advertising.

Radio One Inc., which owns stations in Washington, Baltimore and Atlanta that appeal to African-American audiences, also does not currently air hard liquor ads.

"We're not pursuing it, (but) will look at it on a case-by-case basis," said company president Alfred Liggins. "If somebody came and wanted to put Chivas Regal (liquor commercials) on my black talk radio station that's targeted to a 35-to-54 (audience), I'd do it."

The Rev. Jesse Brown, a Philadelphia anti-alcohol activist, stated that he does not feel the liquor companies are specifically targeting African-American

audiences. However, he continued, the advertising "may have some of the greatest effects on us."

Information supplied by the National Institute on Alcohol Abuse and Alcoholism shows that African Americans suffer a higher rate of alcohol-related health problems than the population as a whole.

Brown, who also heads the National Association of African Americans for Positive Imagery (NAAAPI), said the group would like to see the federal government ban all alcohol advertising.

"It would include not only hard liquor, but beer commercials as well," Brown said.

"We can no longer expect the alcohol industry to live up to any voluntary code of conduct, which they have failed to do from the very beginning."

As an example, Brown pointed to ad campaigns that encourage consumers to "drink responsibly."

"That is not the smartest message ever put out. In order to drink responsibly, first you have to drink. What is responsible for one person may quite different than what is responsible for another," he said.

NAAAPI would prefer messages such as "Alcohol and Abuse" and "Losing Control."

"That in itself would likely be sufficient to cause the industry not to advertise



The Rev. Jesse Brown is an anti-alcohol activist and head of NAAAPI.

at all," Brown said.

Seagram, the first company to break the voluntary hard liquor ad ban, continues to run spots on radio stations across the country.

Responding to charges that liquor companies target radio stations with largely African-American audiences, Seagram spokeswoman Bevin Gove said, "We are not specifically marketing our brands to one segment of the population."

Hacker acknowledged that because so few minority-owned radio stations are willing to accept ads, "It's hard to make any conclusive judgment. But clearly, it's a cause for concern given the financial needs of those stations."

NEWSWATCH

► **NEWSWATCH**, continued from page 2
15 members. The deadline for nominations to the committee was Jan. 27. Office of General Counsel spokeswoman Sheryl Wilkerson said criteria to be used by the commission in choosing committee members had not been determined.

Spectrum Auction Update

WASHINGTON The FCC closed its auction of the D, E and F blocks of broadband personal communications services spectrum last month. The auction raised more than \$2.5 billion for the U.S. Treasury.

The commission is scheduled to begin the auction of the 2.3 GHz spectrum for wireless communications services by April 15. The deposit of the proceeds must be received by Sept. 30.

Newspaper Circulation Declines; Radio Listenership Remains Stable

NEW YORK Interep Research, which has been monitoring reports on advertising expenditures, said that despite a decline in newspaper circulation over the past five years, spending on newspaper advertising has not substantially declined.

"It is our mission ... to bring the facts about newspapers to advertisers," said Interep Radio 2000 President Stewart Yaguda.

"We are confident that once advertisers see the clear advantages that radio brings to the table, their spending patterns will change."

Of the 17 major local newspapers in the top 10 radio metros, 13 saw declines in circulation since 1990, two went out business and only two reported circulation increases.

Despite this, the amount of national advertising dollars spent on newspa-

pers grew by 45 percent over the past five years.

Meanwhile, according to the Arbitron National Database, the weekly cume rating for 12-plus radio listenership within the top 10 radio metros has hovered around 96 percent over the past five years.

This group spends an average of about one day per week listening to the radio.

Competition Chief Leaves FCC

WASHINGTON FCC Competition Division Chief James Olson leaves the commission this month to join the Washington branch of the law firm of Howrey & Simon.

Olson focused on competition and regulation/deregulation issues while at the FCC.

He was appointed by Chairman Reed Hundt to serve as liaison with the Department of Justice during the implementation of the Telecommunications Act.

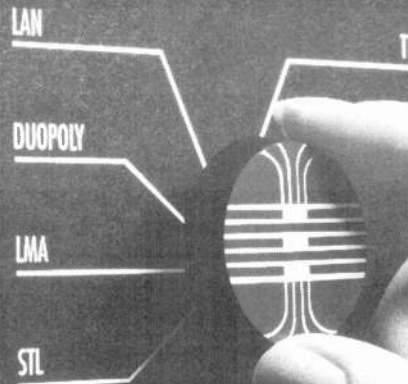
He also served as a liaison between the DOJ and the Mass Media Bureau on media merger issues.

"His expertise will be particularly helpful in our growing practice in the area of mergers and acquisitions of broadcast companies," said Ralph Savarese, managing partner with Howrey & Simon.

Other recent movement within the FCC includes the naming of John Nakhata, former senior legal advisor to Hundt, as acting chief of the Competition Division of the Office of General Counsel.

Jackie Chorney, former legal advisor to Hundt, was named acting senior legal advisor. Tom Boasberg, former senior legal advisor to the Chief of the International Bureau, replaced Chorney as Hundt's legal advisor.

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Murphy's Law Wreaks Havoc, Staff Humbled

WASHINGTON Have you ever worked on something for years — tweaking, fine-tuning, improving — until you reach a point you feel every partner involved in the project is cruising along, making perfectly timed and executed contributions to the end result?

And then, just when you thought, *Eureka! we've got it*, had ol' man Murphy descend on you with a vengeance?

In the last **RW**, we were nailed in just that way. I mean, here we sat, pretty pleased with the new look of the paper. Editorially speaking, Paul, Al, Matt, Chris, Linda and Susan are just about the best team I've had the fortune to work with and, thanks to reader and advertiser support, the paper is just hitting on all cylinders. And then, through a combination of printer error, delayed blueines, miscommunication and missed opportunities, a domino effect was unleashed on poor **RW** that probably left readers scratching their heads and managed to penalize one of our staunchest supporters: Telos Systems.

And I hope things don't look that bad to you, the reader. But, let me explain. The *Focus on Internet* special report was designed to inform you about the Internet, and how radio stations can exploit it to be better broadcasters. It was with some concern then, that I opened the newly arrived **RW** and discovered that our printer had mistakenly placed a page of *Product Guide* (which, as you know, belongs in *Studio Sessions*) and in so doing, blew away some terrific editorial coverage on WCLV(FM) in Cleveland, among other things.

WCLV became the first station to initiate permanent, full-time webcasting using Audioactive technology by Telos Systems.

During the first week of webcasting in November 1996, the number of weekly hits increased from an average of 23,000 to 29,000, according to a station spokesperson.

At press time, Audioactive was used by Cleveland stations WCLV(FM), WMJI(FM) WCSB(FM) as well as

KSHE(FM) in St. Louis and the Macintosh Music Network on-line concert series. Telos President Steve Church said another 100 stations were "either signed" or "very close to being signed" to broadcast on the Internet with Audioactive.



We will run the editorial that got blown out in upcoming issues, but I wanted to let you know that we do apologize for any inconvenience this may have caused — and we apologize to Telos for their omission from the section, however inadvertent.

★★★

I received a note from Howard Mullinack at Orban. Jesse Maxenech, who many of you know, retired from the business effective Jan. 24. Jesse has been battling carcinoma during the last six months, although he continued to work on behalf of Orban (he has been with them for 16 years and in the industry for 40).

In a memo to Orban dealers and representatives, Mr. Mullinack writes: "It is with deep regret that we bid farewell to Jesse. All of us at Orban will miss him, both personally and professionally. Our hearts are with him in his efforts at recovery, and we wish him the very best retirement."

I too will miss him. Jesse was ever ready to lend a helping hand or dole out knowledge and advice on the industry he knew so well and that I came to just five years ago. In places as diverse as Tucson, Las Vegas and Buenos Aires, his kindness and friendship were proffered. Thanks Jesse and best wishes always.

Orban promoted Rick Sawyer to the

position of sales manager, North America, effective Jan. 27.

★★★

By the time you read this, the Washington Chapter of the American Women in Radio and Television will have celebrated its biennial congressional gala welcoming the new Members of the 105th Congress. Honorary Chairmen of the event are Senate Majority Leader Trent Lott, Speaker of the House Newt Gingrich, Senate Minority Leader Tom Daschle and House Minority Leader Richard A. Gephardt. Emcees for the evening were NBC "Meet the Press" Moderator Tim Russert and CNN Prime Anchor and Senior Correspondent Judy Woodruff.

Scheduled for Feb. 12, the gala was to be held at the House Cannon Caucus Room.

★★★

Did you ever wonder what the Federal Communications Commission did with all its surplus equipment after the downsizing it has experienced during the last few years? Apparently, one of the things it does is donate surplus computers and "associated electronic equipment" to seven schools in the Maryland and Metropolitan Washington area.

On Feb. 1, the FCC Compliance and Information Bureau Columbia Maryland Operations Center hosted a "Computer Reconditioning Day." Parents and faculty members from the seven educational facilities joined FCC staff volunteers to inspect, test and recondition the computers. Once the reconditioning was completed, the schools immediately took possession of the computers. The Maryland Schools involved in the program are Hillside, Manor View and Damestown. The District of Columbia Schools are Key,

Keane, Patterson and Stevens.

According to the FCC, the "initiative supports the National Administration continuing volunteer effort toward development of equitable access to information technology, for all students."

Nice job.

★★★

Two last notes. NAB is just around the corner and those of you attending can come by our booth and say hello. We also will be producing the NAB Daily News, the official newspaper for the NAB convention on-site.

Five **RW** contributors and myself will be involved in sessions as presenters and/or moderators. That's right, Cris Alexander, Troy Connor, Tom Osenkowsky, Alan Haber and Tom McGinley will be sharing their knowledge and insights about the business with the gathered radio professionals. Our wrap-up issues will feature a full report.

Secondly, the NAB Radio Board selected Seattle as the site of the 1998 Fall Radio Show.

That is it for now, though.

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No good reason for EAS

Dear RW,

The article by Tom Taggart in the Jan. 22 issue is an excellent analysis of EAS.

We have bowed to the missile threats of a foreign power and tried to comply with the ridiculous Conel-Rad system. We bowed to the threat of the FCC regulatory power and all installed EBS systems. There was no good reason why we should have such a system, but we all complied. Then we stood idly by while the new EAS system was created. Where were we when this was going on? We should have been marching on Washington to point out that no such system was needed at all. Responsible stations have their own much more work-

able systems, as Mr. Taggart pointed out.

Mr. Taggart is right. EAS was developed for the benefit of the regulatory people, and, I might add, the equipment companies. But the blame should be placed at the feet of the 12,000 radio stations who ignored the process and let it happen.

Frank Luepke
General Manager
KIWA-AM-FM
Sheldon, Iowa

To gun or not to gun

Dear RW,

Lewis Downey objects to the photograph of the "Greasegun" on the Nov. 27, 1996 issue (*Readers Forum*, Jan. 8). I believe he is suffering from the gun-phobia that seems to be irrationally taking over our country.

He states that the weapon is a (gasp) automatic weapon. How can he make this assumption? Most automatic weapons come in semi-automatic versions that are commonly available to the general public. They are most often cosmetically identical; they differ in a few minor internal parts and perhaps a safety lever. Only the fully automatic weapons (as Downey used in Viet Nam) require a special federal permit; these too are readily available to law-abiding citizens willing to pay a registration fee. Semi-automatic weapons are used for many purposes; I hunt deer using one. Bill Clinton hunts ducks with one.

Incidentally, the type of gun pictured with the "Greasegun" is commonly known by gun buffs as a "Greasegun." Gee, what a coincidence!

While I agree that killing is not a light-hearted choice, I would have to point out that show-business is, and highly-paid "personalities" (announcers) are certainly part of show business. Machine guns have been a part of Hollywood since the first gangster "greased" someone in an old B&W film. Programming (i.e. "show biz") has been a part of *RW* for several years.

For the record, I have never heard Tracht's program, and I suspect I would not enjoy it.

William Fawcett
President
Mountain Valley Broadcast Service Inc.
Harrisonburg, Va.

No apology due

Dear RW,

In his commentary in the Dec. 11, 1996 *Readers Forum*, Gary Shapiro of the Consumer Electronics Manufacturers Association/EIA attacks USA Digital Radio by parroting an unsatisfactory defense to the errors and manipulations that occurred throughout the EIA DAR system testing.

USADR's performance claims have nothing to do with the inherent questions of accuracy, relevance and integrity in the EIA testing. It is a matter of public record that the IBOC DAB systems were

We'll Miss The Boss

For 23 years, the FCC has enjoyed two constants: change, and James H. Quello.

Now this much-feted commissioner says he will vacate the seat he has held on the industry's regulatory body since 1974.

We'll miss him.

His awards are numerous. In just the past two years he entered the Radio Hall of Fame, the NAB honored him with its Belva Brisset Award, Michigan

State University gave him its Distinguished Alumni Award and the industry gathered to salute him at the John Bayliss Media Roast. He deserves the honors. Quello served the country in the Army during World War II, served radio as a leading light at WJR-AM-FM Detroit and president of the Michigan Association of Broadcasters, served his community on the Detroit Public Housing and Urban Renewal Commission and the Michigan Veterans Trust fund, and served the public interest as a Nixon appointee to the FCC. When the commission needed an interim chairman between Al Sikes and Reed Hundt, Quello was there.

Has Quello always voted with the broadcasters? Of course not. How could he, when broadcasters do not speak with one voice? Many would disagree with his positions on ownership caps, on spectrum auctions, on Howard Stern. But more than most, Quello knows his radio, and thus has been an informed regulator.

If you have heard Quello speak in public, you might find him pleasant but somehow reserved, even a bit nervous. At his ease, the commissioner is blunt-spoken yet gentlemanly, even disarming, and his sense of humor prevails. During a recent interview with *RW* in his office, Quello looked back over his career with obvious pride. Asked about his radio memories, he proceeded to interview himself, reeling off anecdote upon story.

He has served with a style and commitment that his successor would do well to emulate.

We suggest one more honor: a technical term called the Quello Constant. It describes the character of a diligent public servant with extensive knowledge of his industry. At this time of overwhelming demands on the FCC from telco, the big TV players and new media, radio needs a commissioner who understands it — not a well-meaning bureaucrat or a politically connected friend. We urge President Clinton to apply the Quello Constant to his FCC nominees.

Good luck, Boss.

—RW

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tested at power levels significantly lower than IBAC DAB or Eureka-147. The IBOC system power reference level was the composite signal and was dominated by the analog FM signal itself.

Yet, Eureka-147 proponents claim one of the advantages of DAB is that it will not require the large ERP of conventional FM transmitters. Thus, there should not have been such a large discrepancy in power levels for testing, particularly considering the large propagation losses at L-band. It is also a matter of public record that the EIA failed to execute the multipath characterization/emulation according to the agreement reached with the proponents. Instead of accurately reproducing the acquired field data (which ended up being only selected locations around Salt Lake City due to various EIA field testing errors) on the HP multipath emulator as frame-by-frame "snapshots," they resorted to implementing arbitrary channel models, strongly influenced by members of the CRC/Eureka-147 contingent, using a Rayleigh channel model even in clear line-of-sight Rician propagation conditions.

It is a matter of public record that the EIA failed to accurately calibrate the power levels for the multipath emulator correctly, resulting in power discrepancies as high as 8 dB!

After grudgingly admitting fault, they published a series of "fudge" factors to apply to the D/U interference tables. However, you cannot apply linear fudge constants to the multipath profiles, which were essentially pass/fail. Furthermore, the interaction between modulation and error correction coding is highly nonlinear.

Interestingly, the EIA has decided to adjust the emulator power levels for the high-speed subcarrier testing now in process. It is a matter of public record that

despite the fact that the laboratory Eureka-147 system tested was a single-transmitter configuration, only the multiple-transmitter configuration was proposed for use in the field tests (believe it or not with gap-fillers!), citing "time concerns."

It is a matter of public record that the Eureka-147 proponents were allowed to initiate a study of the area designated for the field tests only after the field test location was made public, resulting in their request for a change in transmitter configuration. Mr. Shapiro is correct in asking for unbiased, third-party testing for DAR systems.

It is unfortunate that the EIA didn't fulfill that requirement. The EIA deserves no apologies. Instead, the broadcasters, the taxpayers and the FCC deserve an explanation.

Derek Kumar
Former DAB Engineering Manager
National Semiconductor
Champaign, Ill.

Chimes redux

Dear RW,

I greatly enjoyed your article on the NBC chimes (Dec. 25, 1996). I would like to add a follow-up thought. Although the same three musical notes were used on the chimes at the three main network origination points, New York, Chicago and Hollywood, one could immediately tell if the show had originated from Chicago.

Those chimes were of a different timbre. Just dig out an aircheck from the 1940s of a Chicago show like say Vic 'N Sade or another Windy City program and the difference can be noted.

Doug Cramer
Los Angeles

GUEST COMMENTARIES

EAS: Boon or Boondoggle?

In the Jan. 22 *RW*, Tom Taggart, part owner of radio stations in St. Marys, W.Va., wrote a Guest Commentary in which he took EAS and its supporters to task. The issue, he wrote, is not one of public safety, but rather of preserving government jobs and creating income for the FCC.

Here are three other viewpoints on this important issue for radio stations.

The great potential of EAS

Dear *RW*,

Mr. Tom Taggart's cynical view of the EAS system seems to be rooted in the conviction that nothing good can come from a federal bureaucracy.

The new EAS system and Part 11 rules were indeed promulgated by the FCC, but they did not do it alone. The process involved the Federal Emergency Management Agency and the National Weather Service. From the first Notice of Inquiry in June 1991 through release of the final rules in October 1995, the normal comment and reply practice was followed.

Many broadcasters, engineers, manufacturers and emergency management agencies participated in this important process. I failed to find Mr. Taggart's name among them.

I agree that the need for a national alerting system just for contingency of a national emergency is dubious at best. But, as Mr. Taggart points out, 99 percent of all EBS activations have been for local emergencies. If the EAS system has intrinsic value, it is in the standards created by the rules.

These standards allow us to create an infrastructure through which emergency messages, generated by official sources, can flow from one local area to another. The information is thus disseminated through all stations having coverage in

the area affected by the emergency.

Mr. Taggart has problems with the concept of a local jock at an LP station generating real emergency header codes, getting it right, and sending an alert in a timely way. I couldn't agree more. The job of originating the header code and emergency announcement belongs to the National Weather Service and the Emergency Management Directors. They are the responsible officials being paid to perform this function, not the broadcaster. Of course, EMA officials will need encoders connected to the LP stations to make it work.

I believe that state and local EAS can work and that it has great potential for saving lives and property. This will only happen if state and local emergency communications committees take their planning role seriously.

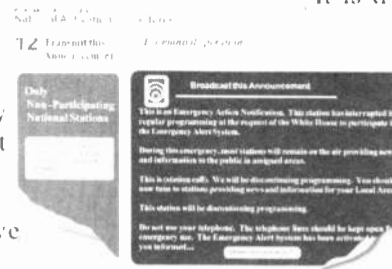
Rather than complaining about the inherent weaknesses and costs of the system, the SECC in Ohio is working with the emergency management community and the National Weather Service to make EAS as effective as possible.

My advice to stations is consult your state and local plans and make an effort to comply with their provisions. If plans are not yet available, contact your local area chairperson to obtain information concerning participation and monitoring assignments.

Mr. Taggart complains of EAS hype. Frankly, the only hype I have seen comes from the equipment manufacturers' ads, and we have to take that with a grain of salt. Most of what is being written in the pages of *RW* and other trades is constructive. These articles help all of us understand a necessarily complicated system.

The solution for world peace and greater share points? Hardly. But since the FCC requires installation of EAS equipment and participation at the

national level, why not try to make it something of value? Who knows, we might even save some lives.



William C. Glasser
Canton, Ohio

The author is director of engineering for WHBC-AM-FM in Canton and chairman of the Ohio State Emergency Communications Committee.

Did you participate?

Dear *RW*,

It is entirely unfortunate that too many broadcasters out there share the view of Mr. Tom Taggart in that all the FCC has to do is sit around and think up new ways to fine broadcasters.

Mr. Taggart's problem with the FCC seems to be a problem with government in general, and therefore, he cannot see the forest for the trees.

Granted, most broadcasters feel that the EBS was a waste of time and effort on their part, and there was plenty of justification for that belief.

But this was mostly due to the fact that while communications technology was improving rapidly around the world, the EBS was never a benefactor in that improvement, until now.

The EBS was a cold war relic. That's because the EBS was never allowed nor required to mature.

It was a flawed system, but no one from the broadcaster to the FCC made it a priority. Neither local broadcasters nor area governments would justify the time or expense to sit down and develop a plan, together, that addressed each others' needs and utilized their capabilities. But in 1997, the time has come to make

the system come of age.

It is true, almost all EBS activations were local and weather related, and that a state or nationwide activation is highly unlikely. This should hold true for the EAS as well. But don't we all buy tons of insurance with the hope that we never have to use it?

If you have lived through or worked during a major flood or hurricane, or lived next door to a nuclear power or chemical manufacturing plant, you can easily see the need for a state or local government to possess the ability to pass information to the public.

We all know that there is no better way to rapidly and efficiently inform the public in mass, than through the local broadcaster.

With the development of the EAS, the FCC gave the local broadcaster the freedom to develop and participate in a plan based on their desired level of participation.

For those managers and owners who didn't care to take part in the development of their state plan, you have only yourselves to blame if you don't like the plan you were given.

You had your chance to make your suggestions and desires known to your state committees long before Jan. 1. For years, broadcast owners have been given more and more freedom from government regulation, especially in regard to public service.

But for too many, any requirement the government makes is considered unreasonably intrusive, no matter the intent. Nonetheless, there are still those broadcasters out there who understand the spirit in which their license was granted, and that the use of the public's spectrum must be respected as a privilege and not as a right.

With the proper organization and planning, government and broadcasters can develop a working system that will keep the public informed during an emergency. It has been done.

Take a look at the public warning system that was built in Contra Costa County in California. The cooperation and effort by all parties here in Tennessee is at an all-time high.

It takes the time, patience, cooperation and dedication on the part of many people, but we believe that our listeners and viewers, our public, are worth the effort.

Paul Luke
Memphis, Tenn.

Paul Luke is president of the Emergency Communications Auxiliary of the Mid-South Inc., a non-profit organization made up of broadcast and emergency management professionals. Its stated mission is to foster the development of emergency communications programs for the public and private sector, and for the ultimate benefit of the public.

ECAMS Inc. developed the EAS plan for the state of Tennessee.

Another take

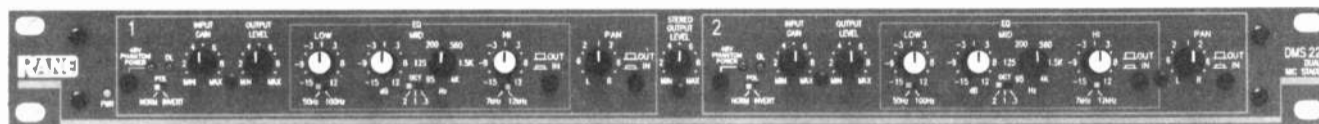
Dear *RW*,

The road to EAS implementation has been a bumpy one. Crawford Broadcasting Co. operates 19 stations in nine states, and as we have made the switch, I have seen great variations in the

See EAS, page 7 ▶

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Circle (2) On Reader Service Card



► EAS, continued from page 6
level of preparedness from state to state, and even market to market within the same state.

Company wide, we spent more than \$40,000 to implement this system, in many cases displacing costly EBS equipment that was only a couple of years old. The FCC has forced this on us, as it did NRSC a few years ago, and many stations simply cannot afford to shell out several thousand dollars for equipment that has no benefit for the station.

For the most part, stations now seem to have their EAS gear in place. All things considered, however, I believe the broadcast industry was ill-prepared for the switch to EAS. Here are some specific problems. In two states in which we operate, state plans call for stations to monitor four different sources. We tried to be prepared and ordered our EAS gear early, and the equipment we received came equipped, as FCC rules specify, to

accept two inputs; additional inputs required optional equipment. From a financial standpoint, it galls me that to comply with these four-source mandates, we would have to spend yet more money on equipment.

In several of the states, no plan has yet been adopted. Stations don't know who to monitor, so for the moment, they are monitoring their old EBS monitoring assignment. This is better than nothing, but not by much. If these state committees were having so much trouble devising plans, they should have called for a delay in EAS implementation. Perhaps the FCC would have listened to them.

No LP-2

At one of our other markets, there is no LP-2 station in the state plan for that particular operational area and no second source for us to monitor. There are no full-time stations in that part of the state with a sufficient coverage area to be useful as an LP-2 station.

Most of these problems will be worked out in time as state committees address the issues, revise and finalize their plans. My hat is off to the individuals who serve on these committees. It is a thankless job, but it is necessary nonetheless.

Perhaps the bigger issues have to do with the FCC requirements. The EAS rules look pretty good on paper, but out here in the real world, some of the provisions are not practical.

The FCC rules state that the Required Monthly Test must be forwarded within 15 minutes of receipt. What happens when the test is received two minutes into a 30-minute block of programming? TV stations may find themselves in the position of having to dump a network spot to run the RMT in the next break. That costs money.

Many of our radio stations sell programs in 30-minute and one-hour blocks. When the RMT comes in during one of these, we have to dump out and forward the test. This is usually followed by our clients asking for a part of their money back for the interruption, and who can blame them? The FCC needs to take another look at its RMT requirements. A 30- or 40-minute forwarding window would be much more practical.

Yet another FCC requirement that doesn't work is that the EAS codes modulate the transmitter at a minimum of 80 percent. If the EAS encoder is installed in the audio chain ahead of the audio pro-

cessing gear (as it should be), it may be impossible to achieve 80-percent modulation with the codes.

Processing problems

If, in an effort to comply with the modulation requirement, the encoder is installed after the audio processing gear, there will be no processing to the retransmitted audio, and the results will be overmodulation and poor intelligibility of the message audio.

Clearly, the FCC needs to re-evaluate the 80 percent rule. Tests have shown that EAS decoders work fine with modulation levels as low as 40 percent.

Finally, is there an FCC rule that requires

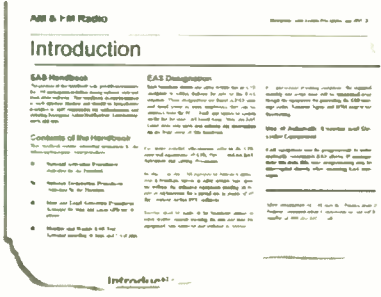
stations to have Internet access? I believe that the FCC created a *de facto* Internet access requirement in the method by which it has distributed its EAS Handbook. The FCC rules state that all stations must have immediate access to the EAS Handbook. But at this writing, the handbook has not been published in printed form yet.

Are stations that do not have Internet access, and thus do not have the EAS Handbook, as yet in violation of the FCC's rules? It appears so. Not only were the states ill-prepared for EAS; the FCC was not ready, either.

I hope that, in time, many of these problems will be resolved. It will be up to us, the broadcasters, to let those in a position to make the needed changes know what must be done. Contact your state committee with your beefs. NAB members should be in contact with the NAB, and all of us should contact the FCC and point out the problems. EAS has the makings of a good system, but as our chief engineer in Chicago said, "Right now, EAS is more an *emergency* than a *system!*"

W.C. Alexander
Dallas

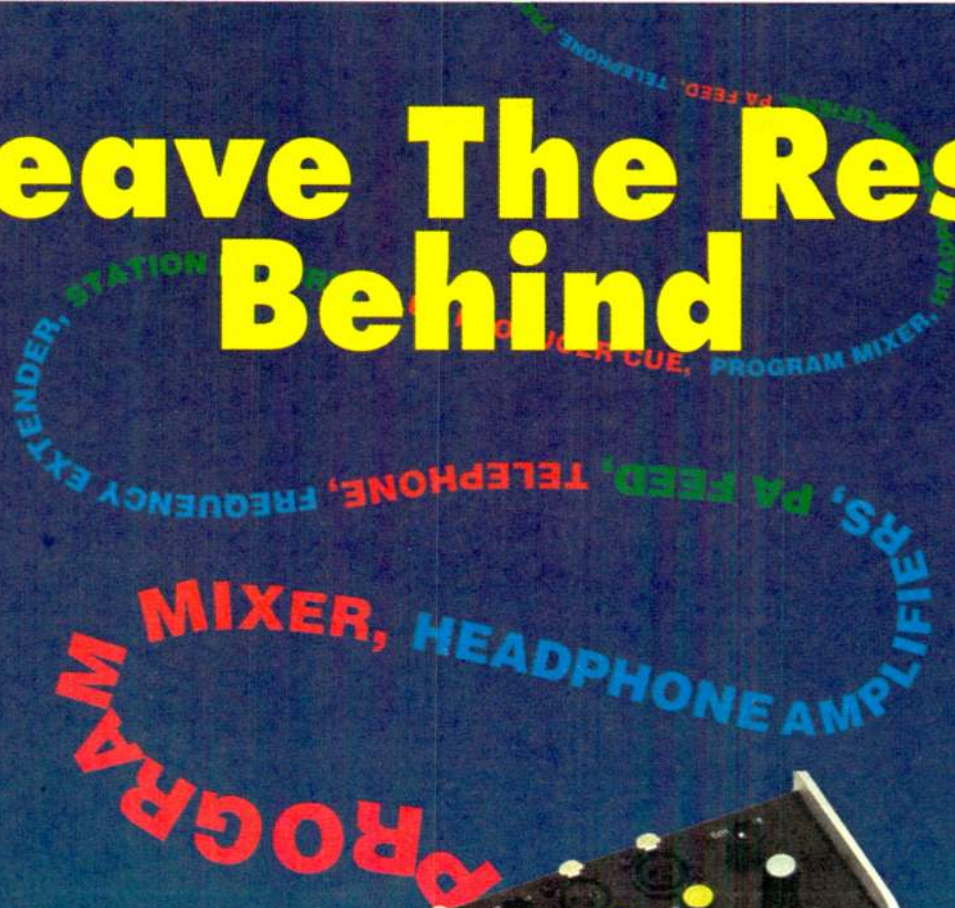
Cris Alexander is director of engineering for Crawford Broadcasting in Dallas and a regular contributor to RW. The opinions expressed in this letter are his own.



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additional inputs required optional equipment. From a financial standpoint, it

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Circle (23) On Reader Service Card

Small Market Next for DOJ?

by Matt Spangler

CENTRAL CITY, Ky. Government intervention in mergers and acquisitions has been played out on battlefields like Boston and Philadelphia, where Westinghouse/Infinity was obliged to spin off stations, or Rochester, N.Y., where American Radio Systems had to give up some of its holdings. The next stage in the war to be the biggest, however, may begin in the sleepy town of Central City, Ky.

The players squaring off against one another in that small market are stand-alone 500 W WMTA(AM) and local media giant Starlight Broadcasting Inc.

The prize: FM frequency 104.7.

WMTA filed for that frequency on May 15, 1996 to use for a 30 W FM translator station in order to expand its local coverage area. At the eleventh hour Starlight filed for a translator on the same frequency.

The little giant

So what's the problem? According to Bryan Smeathers, general manager of WMTA, Starlight may have not only a monopoly on radio in the Central City market, but on other media as well. "(Starlight) is trying to get control of all the airwaves in this small part of rural Kentucky," Smeathers said.

To date, Starlight owns three of the rural county's four radio stations, 1 kW WNES(AM), 100 kW WQXQ(FM) and a 6 kW station purchased last September. The entity also owns one of the county's two weekly newspapers and one-third of the other. In nearby Ohio County, Ky., 18 miles away, Starlight owns both radio stations and both weeklies.

Smeathers said that Starlight controls so much of the local market because the counties are considered by the Federal Communications Commission to be part of the Arbitron-ranked Evansville, Ind., DMA. Starlight owns no stations in Evansville, but the city is part of the WQXQ coverage area.

However, Smeathers said WMTA doesn't serve Evansville because it is 80 miles away, out of the range of its 500 W transmitter. Smeathers criticized the FCC definition of the market, saying, "Arbitron shouldn't dictate what a market is to the FCC."

Hence, WMTA asked the Justice Department to get involved. The station contacted Deputy Attorney General David Turetsky in December and asked his office to look into potential antitrust violations by Starlight. "It's obvious what they're doing," Smeathers said. "They're not going to bring in other stations to compete against their radio stations here."

Starlight Operations Manager Stan Barnett said the group wants the translator in order to cover dropouts it is experiencing on WLLS-FM, a 3 kW station it owns in nearby Hartford, Ky. These dropouts have occurred in the Central City area. "We want to have a local mix with everything we're doing," Barnett said.



Smeathers said that WLLS does not need the translator. "All of their stations cover the area just fine," he said.

In late January, the DOJ told Smeathers it was looking into the matter, and also recommended that he contact the state of Kentucky attorney general's antitrust unit. Smeathers said he was surprised that Justice would suggest a state role in a federally regulated industry.

Endangered species

The Central City case seems to be indicative of a larger problem that has come about as a result of the Telecommunications Act. Washington attorney and **RW** columnist Harry Cole said Congress confused the issue by raising the multiple ownership cap but leaving the definition of a "market" up to the FCC.

In the ARS deal in Rochester, Cole said, that radio group increased the size of its market according to FCC definition by showing that the city grade contours of some of its stations overlapped with some of those in Buffalo. When the Justice Department stepped in, however, ARS was forced to divest three of its stations because the department felt the group would command too much revenue share in the Rochester market.

As Starlight owns no stations in Evansville, Cole guessed that WMTA was considered part of the Evansville DMA because, for the purposes of defining Starlight's market, the city is part of the group's coverage area. "The 100,000 watts presumably gets its city grade out far enough in some direction to pick up a bunch of other signals overlapped from other stations, which puts them in a bigger market," Cole said.

"For the purposes of the small broadcaster, Central City is Central City; for the purposes of the big broadcaster who

See WMTA, page 14 ►



The Dynamax MX/D Digital Audio Console

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Circle (21) On Reader Service Card

World Radio History

Are You Diligent?

► IDS, continued from page 1

involved were satisfied that FMOC, which was buying the time, was in fact the real sponsor.

However, another group, the Committee to Support the Oregon Health Plan, or CSOHP, alleged in a complaint to the FCC that the real sponsor was actually the Tobacco Institute. That allegation was based on a number of factors.

First, all but \$20 of the \$2,664,600 raised by FMOC had been donated by the Tobacco Institute. Second, FMOC's two directors and only members were registered lobbyists for R.J. Reynolds, a company "with substantial interests in tobacco products." Third, R.J. Reynolds is the

largest single contributor to the Tobacco Institute. Finally, the address and phone listings for FMOC were the same as for the FMOC directors' lobbying firm.

Independent judgment?

Presented with these allegations in late October, shortly before the November elections, the FCC asked the stations for a response. All stations advised the commission that they believed that FMOC was the sponsor. At least one station told the FCC that the station had received a letter from the FMOC counsel stating that the Tobacco Institute exercised no editorial control over the FMOC campaign. According to that station, the

FMOC counsel had advised the station that editorial control was exercised by one of the two FMOC directors.

But based on the CSOHP claims, the commission concluded that the Tobacco Institute was the "true sponsor" of the ads, and ordered stations not to air the FMOC announcements without identifying the Tobacco Institute as the sponsor.

The commission was convinced by the claims that "essentially all" of the FMOC funds came from the Tobacco Institute and editorial control of the FMOC campaign "rests exclusively with lobbyists for R.J. Reynolds, the single largest contributor to the Tobacco Institute."

According to the FCC, it was "simply not credible" that the two FMOC directors, who happened to be R.J. Reynolds lobbyists, were exercising any "independent judgment." Finally, the commission

noted that there was no evidence that anyone not employed by "tobacco interests" had any role in FMOC activities.

Implications

The notion that broadcasters should look behind the identity of their advertisers to try to determine if hidden interests are at work is novel. The sponsorship identification rule (Section 73.1212 of the FCC rules), which is derived from Section 317 of the Communications Act, does require that where "an agent or other person or entity" makes arrangements for airtime "on behalf of another," and where that "fact is known or by the exercise of reasonable diligence ... could be known to the station," then the ID announcement must disclose the identity of the person/entity on whose behalf the agent is acting, rather than the agent's identity.

It is not clear how the stations could have been more "reasonably diligent" than they were. This is especially true because the commission's ultimate decision appears to be based on circumstan-

Eliminate Carts for \$7,000

Scott Studios' Spot Box

At last! A commercial player that *works just like carts*, but with digital audio that *sounds like compact discs*.

It's Scott Studios' new *Spot Box*. It's the *first* hard disk "cart" replacement that *jocks really like!*

It's *easy to use*: You get four Start buttons for four recordings, just like a quadruple deck "cart" player.

The Start button clearly counts down the remaining time of each cut. Every deck shows "bar graph" VU levels.

When a "cart" finishes, the label and buttons turn grey to lock out accidental re-play. It can air again with a touch of the Replay button (at the lower right). If there are more than four "carts" in the set, the "on deck" spot moves from the fifth line (at the right of the time and date) to the grey deck that had played. The Spot Box can also remote start CD players.

The Manual-Auto button (at the right of each label) lets you start each spot manually or have the Spot Box smoothly start the next one itself. Automatic sequencing can also be turned on or off globally, by categories or shifts.

Pause buttons can stop (and resume) playback of any cut. During a Pause, the Start button can replay that recording from the beginning.

Each deck has a Fade button. It helps if you need to fade something out gracefully with one touch.

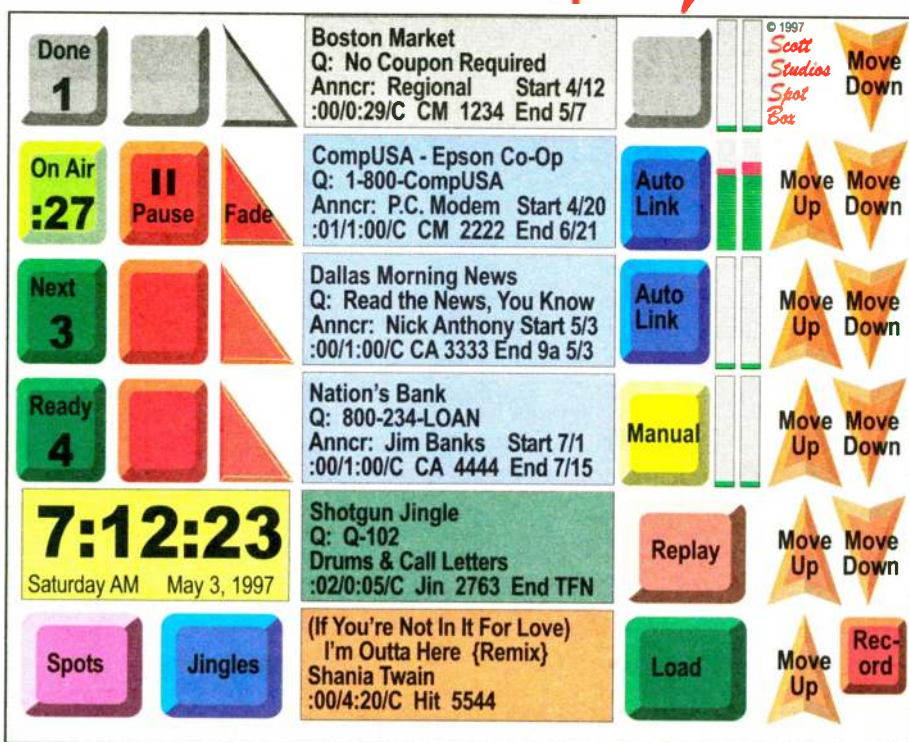
The Spots and Jingles buttons at the lower left take you to a "Wall of Carts" screen that shows *all* of your hundreds of recordings. You can jump immediately to whatever you want by touching the first letter of its name on the large alphabet at the top of that screen. Pick and play it quickly in any "cart" deck.

As an option, we can automatically bring logs into the Spot Box from your traffic computer. Then, after the spot set has finished, the Load button at the lower right automatically brings in the next break.

You can quickly rearrange the order of any recordings with the Up and Down Arrows.

Scott Studios' Spot Box not only *sounds better* than any "carts" you've ever heard, its labels *look better* and are easier to read than any "carts" you've ever seen!

You get four legible lines of useful label information: Names, numbers, out-cues, announcers, intros, lengths,



Here's a reduced size view of Scott Studios' 5"x8¼" Spot Box. You get easy access to hundreds of commercials, jingles, sounders, comedy and other recordings. All audio is CD quality digital from hard drives.

endings, copy info, start and end dates and times, schedule times, and anything else you want. Labels are even color coded. When you have several cuts rotating as one number, you see exact lengths. Both the name and out cue match the exact cut that plays. The Spot Box even rotates recorded tags.

If you have several stations in one building, record each spot only once. It's instantly playable in *every* desired studios' Spot Box, without re-dubbing or retyping labels. Cuts can be locked so they only play on designated stations or shifts.

You also get printouts showing *exactly* when each spot plays!

Best of all, Scott Studios' digital audio is *affordable*. A "four-deck" Spot Box player storing 600 minutes in stereo starts at \$6,000. You can record and edit spots or phone calls in the air studio during songs for only \$1,000 more. A production studio recorder-editor is \$5,000, and it can even go on-the-air if needed. 600 additional minutes of stereo storage is only \$250. Larger screens and a variety of backup options are available. At Scott's low prices, you can afford as much storage and redundancy as you want.

Also check out Scott Studios' Hot Box. It plays *any* of 62 "Hot Keys" *instantly* at the touch of a finger. You get 52 sets of 62 clearly labeled Hot Keys: 3,224 digital cuts for only \$5,000.

Scott Studios also offers other digital systems for satellite formats, music on hard drive and voice track automation. Call 800-SCOTT-77 for details, or a no-obligation trial in *your* station.

The ruling may impose increased obligations on broadcasters.

tial evidence — the source of FMOC funding, the relationship of FMOC principals to R.J. Reynolds, and so forth — which would not normally come to the station's attention in connection with a routine time purchase.

In the Oregon case, the stations understood that FMOC was acting on its own, and they presumably had no reason to look behind FMOC. And when, apparently acting in response to the CSOHP complaint, one station did inquire, it was told that FMOC is, indeed, independent. It is not clear from the ruling exactly what "credible evidence" existed concerning who actually exercised "editorial control" of the FMOC ads, because all the information the commission had related only to the source of FMOC funds and the fact that FMOC principals had ties to a company with "tobacco interests."

The commission ruling may impose increased obligations on broadcasters to ask probing questions of its advertisers, whether or not there appears to be any basis for concern when the advertiser first presents itself with a request to purchase time. Because the FMOC case arose in the context of a local ballot proposition, it is possible that the increased diligence standard may, in practical effect, be limited to that type of political or quasi-political situation.

It is also possible that, in order to protect themselves from claims of violations, broadcasters may be able to include on their time sale contracts a certification, to be signed by the advertiser, that the advertiser signing the contract exercises complete editorial control over the announcements to be aired.

According to the FCC, its ruling "should not be taken to require a sponsorship identification of funding entities when there is credible evidence that such entities do not have editorial control of the ads."

■ ■ ■

Harry Cole writes the column "Cole's Law," which appears regularly in *RW*. He is a principal in the Washington-based law firm of Bechtel & Cole, Chartered.

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Circle (20) On Reader Service Card

FCC Mulls Fee Ideas

► FEES, continued from page 1

association schedule, stations fall into one of four market categories (see Figure 1). The fees paid are staggered according to market category and class of service.

In response to the MBA proposal, the FCC issued a Notice of Inquiry last fall

using Arbitron's ratings reports as a measure. Both ideas were rejected, as had been the case with television. Regulatory fees for TV stations are assessed according to market size.

Now the commission is hoping that the public will provide it with a suitable

Figure 1

MARKETS	AM CLASS A	AM CLASS B	AM CLASS C	AM CLASS D	FM GROUP I	FM GROUP II
1-25	\$6,125	\$3,425	\$1,375	\$1,725	\$6,125	\$4,125
26-50	\$3,600	\$2,000	\$800	\$1,000	\$3,600	\$2,400
51-100	\$1,925	\$1,075	\$425	\$535	\$1,925	\$1,275
Remaining	\$540	\$300	\$120	\$150	\$540	\$360

The Initial MBA Proposal

asking for comments on how regulatory fees might be recalculated. Comments were due December 1996.

Jim Brown, assistant chief of the Video Services Division of the FCC, said the commission had at one time considered basing regulatory fees for radio stations on rate cards, and then on markets,

alternative to the current system. "We've got nothing better until somebody can come up with something, and hopefully it's based on population serviced," Brown said. He also said that the system should be easy for broadcasters to comprehend, and should be "verifiable," meaning that the commission could confirm that a station does serve the size market that it claims.

NAB responded to the notice on Dec. 20 with a proposal that would assess regulatory fees based on a database commissioned by the association. This database, prepared by Dataworld Inc., uses engineering data and information from the 1990 U.S. Census to show the number of people served by every existing U.S. commercial radio station. (MBA also obtained its data from Dataworld.)

Similar to MBA's proposal, NAB's proposed schedule would divide market served into six population categories

Figure 2 AM Stations

Population Served	FCC Class			
	A	B	C	D
≤ 100,000	\$325	\$260	\$125	\$165
100,001-250,000	\$375	\$325	\$175	\$225
250,001-500,000	\$575	\$450	\$250	\$325
500,001-1,500,000	\$975	\$650	\$325	\$425
1,500,001-3,000,000	\$1,500	\$950	\$450	\$575
≥ 3,000,000	\$1,800	\$1,300	\$650	\$750

TOTAL RAISED \$2,387,410

FM Stations

Population Served	FCC Class	
	A, B1, C3	B, C, C1, C2
≤ 40,000	\$300	\$450
40,001-100,000	\$450	\$925
100,001-250,000	\$925	\$1,350
250,001-750,000	\$1,150	\$1,750
750,001-1,750,000	\$1,300	\$2,000
≥ 1,750,000	\$1,650	\$2,750

TOTAL RAISED \$6,108,500

The NAB Proposal

(Figure 2). These categories are based on the population served within a 1.0 mV/m contour of the station. The fees would be further subdivided according to station class of service, as determined by the FCC.

While any reductions in fees for smaller-market broadcasters would have to be offset by an increase in larger markets, NAB said its "Radio Board concluded that modest increase in fee levels would not present a significant burden." Brown also said it was the FCC's thinking that stations in larger markets would have a greater ability to pay fees.

In a show of support for NAB's proposal, 18 state broadcasting associations filed joint reply comments with the FCC last month, calling the proposal "workable and fair." The Arkansas Broadcasters Association endorsed the MBA proposal, however.

In its reply comments to the FCC, filed last month, MBA criticized NAB's proposal, saying the proposal "still puts a disproportionately high burden on small-market stations." MBA suggested that, using NAB's population-based methodology, fees for FM stations should not be affected by their class of service (Figure 3). However, because of the "distinctions

Figure 3 AM Stations

Population Served	A	B	C	D
≤ 100,000	\$65	\$35	\$15	\$20
100,001-250,000	\$220	\$125	\$50	\$60
250,001-500,000	\$405	\$230	\$100	\$115
500,001-1,500,000	\$1,250	\$700	\$300	\$350
1,500,001-3,000,000	\$2,750	\$1,575	\$675	\$790
≥ 3,000,000	\$5,000	\$3,150	\$1,350	\$1,575

FM Stations

Population Served	All Classes
≤ 40,000	\$40
40,001-100,000	\$140
100,001-250,000	\$350
250,001-750,000	\$1,000
750,001-1,750,000	\$2,500
≥ 1,750,000	\$5,000

The Second MBA Proposal

between the nature of the technical service provided by each AM station class," AM fee schedules should be subdivided based on class of service.

If the FCC adjusts the current fee schedule, the new schedule should apply to regulatory fees due this September.

'By joining forces, the managers of Nanaimo's two radio stations made life better for themselves. They've been able to turn two weak AM stand-alones into a financially healthier AM/FM combo, while reducing staff and overhead costs by moving into one building.'
Running Radio, page 52.

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Circle (4) On Reader Service Card

States Have Plenty to Do on EAS

by Lynn Meadows

WASHINGTON If the new Emergency Alert System were a shirt, it would be all cotton.

It will take at least a year's worth of ironing to get rid of the wrinkles that surfaced after the Jan. 1 deadline for equipment installation.

First, the equipment: Rumors of Federal Communications Commission agents visiting stations are true. According to a spokesman for the Compliance and Information Bureau, agents are visiting stations everywhere.

"We're working with the industry," said the spokesman. He said the visits are not so much to see if stations have the equipment, but to check to see how the FCC can help them with that effort. He said the agent can make sure the station has ordered what it really needs.

The spokesman said the bureau has received "innumerable requests for waivers," which it is addressing one by one. If no good-faith effort was made to acquire an EAS box, however, the station would be considered in violation.

As of the end of January, no fines had been levied for failure to comply.

"Not yet," said the spokesman. He said the size of the fines, which are levied by the Enforcement Division, will be determined by conditions.

Still planning

By the end of January, the FCC had received 45 EAS plans, 32 of which were state-level plans, according to Frank Lucia, director of emergency communications. At that time, his office had signed off on 15 of them.

"By and large, people seem to be fairly happy with EAS," said Ed Brouder, chairman of the New Hampshire State Emergency Communications Committee and owner of Man from Mars Productions recording studios.

Most of the wrinkles his state has encountered involve alerts from the National Weather Service. The state has no NWS office, and the NOAA weather radio station in Concord has a range of about 40 miles.

In the days of the Emergency Broadcast System, the NWS would send alerts via UPI or AP wire with the words "EBS Activation Requested." That kept stations outside the NOAA weather station range notified. With the introduction of EAS, a coded, over-the-air system, the NWS has stopped using the AP and UPI alerting method.

But stations that hear the alerts can choose not to pass along weather-related messages. This prevents messages from reaching stations further down the EAS chain that cannot pick up the NOAA weather station alerts. Brouder said he would like the NWS to resume using the AP and UPI to request alerts.

Brouder also hears many questions regarding the "Required Weekly Test." When the NWS office in Maine interpreted the FCC rules to mean that they should conduct an RWT, many stations that were getting the NWS test every Wednesday morning assumed that it satisfied their RWT requirement.

Brouder said the NWS office has been cooperative and drafted a memo to the national office asking about both the UPI/AP notification and the RWT.

Because there is no one signal powerful enough to blanket the state, New Hampshire plans to use its Office of Emergency Management as a primary station.

The OEM will alert specific stations in seven districts via the state police microwave network. New Hampshire plans to send NWS alerts over the microwave network, but that does not guarantee all 88 radio and television stations in the state will hear them.

The 1050 tone

One quick-fix wrinkle is the presence of a 10-second, 1050 kHz tone that the NWS sends with each warning to activate fixed receivers at hospitals and nuclear power plants.

Some stations have broadcast the tone, not realizing it can be filtered out of most EAS equipment with either a hardware or software tweak. Anyone not certain how to get rid of the tone on their box should call the manufacturer.

Many stations have discovered that the equipment they purchased is not what they really needed. Brouder said at least two New Hampshire stations initially purchased remote control units and relay

equipment, only to decide it would be easier and just as inexpensive to use a second box instead.

Some engineers have complained about being left with dead air because the NWS forgot to send the end of message (EOM) tone that returns the station to normal programming. Brouder said his state encountered the same problem when testing in December. They have not had any trouble with the EOM since the first of the year.

Common questions

Lucia said he gets a lot of questions about the RMT requirement that gives stations 15 minutes to retransmit. Some program directors want to be able to wait until a commercial break to do the test. However, because the test can be prescheduled, Lucia recommended stations work with their local primary stations to find a workable time. That way, he said, a program director can know exactly what time an RMT will take place six months in advance.

Thanks to consolidation, many stations find themselves sharing studios. Lucia said stations may use one EAS box even if the cities of license are different, as

long as they can monitor all the sources for those two cities on the one box.

The EAS Handbook is now available from the FCC via the Internet (www.fcc.gov). Brouder said it took him an hour and ten minutes to download it using a Pentium machine.

The booklet was designed to be in color, he said, so a lot is lost in a black and white copy.

The FCC does not plan to send the booklet to every station, but Lucia's office will send it to anyone who requests it; the number is (202) 418-1220. Only a black and white copy was available via the mail at the end of January, but Lucia said he hoped the color version will be available later this year.

He also pointed out that some edits were made to the booklet in late January, so anyone who downloaded a copy early that month may want to get a new version. The handbook must be displayed at a facility's EAS control point.

The Society of Broadcast Engineers also continues to play a leading role in the development of EAS.

The SBE EAS Committee has a page on the SBE web site (www.sbe.org), asking members to send suggestions for proposed EAS rules changes. The only requirement is that suggested changes be beneficial to the entire EAS as well as an individual's area.

The Father of Talk Radio Dies

by Sharon Rae

NEW YORK Barry Gray, the man known as the father of talk radio, died peacefully in his sleep on Dec. 21, 1996. The 80-year-old had been hospitalized since October after developing complications from back surgery.

Gray, born Bernard Yaroslaw, began his broadcasting career at WOR(AM) in New York right after World War II.

"Barry told the story that when he came out of the service, he went to WOR and they gave him an on-the-spot audition," said Larry Kahn, director of talk programming for Westwood One Entertainment. "He was reading commercials that afternoon in the announcer booth."

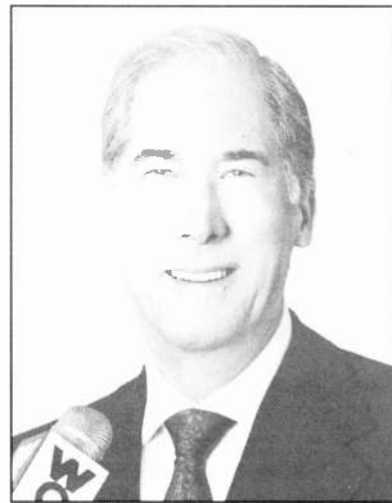
Kahn, who worked with Gray at WOR in recent years, called Gray "a legend."

"He was a passionate man ... with a strong fever and personality. He never lost a step on the radio. He was always number-one at night ... and adapted through the 1940s to the 1990s."

A giant

Gray's 50-year contribution to radio earned him the 1996 Talk Show Host of the Year honors from the National Association of Radio Talk Show Hosts. Gray is remembered for pioneering the telephone conversation format on the radio.

"He was a giant," said Gene Burns of KGO(AM) in San Francisco, immediate past-president of NARTSH, who also worked with Gray at WOR in the early '90s. "Barry Gray did talk radio ... it happened quite by accident. He picked up the telephone in the studio one night and somebody asked a question and he relayed the question. There was no way to put the call on the air, but he actually relayed the question to



the guest he was interviewing and ... that aspect of talk radio was born."

From his early days as a caustic and controversial interviewer in the 1940s at WOR, Gray earned a reputation for his ability to present both sides of an issue while expressing his opinion with passion and humor.

Ironically, the element that made Barry Gray a success was the cause of his first fall at WOR. He was fired after things got "too hot in the kitchen." Gray's own words as written in his autobiography "My Night People."

Gray next enjoyed fame and success broadcasting live nightly at the Copacabana in Miami Beach, which he did for two-and-a-half years. There, Gray helped break the color barrier. "I had clamored for civil rights in a town that made its blacks carry identification cards," he said in his autobiography.

In 1950, Gray returned to New York to host at WMCA(AM), where he spent the next 39 years as the Big Apple's longest-running and highest-paid radio interviewer.

In 1989, when WMCA switched to

religious programming, Gray's career circle continued with a return to WOR. He worked the 10 p.m. to 1 a.m. slot, then moved to the 7 to 9 p.m. shift.

Physical danger

During his half-century as a fixture on the airwaves, Gray interviewed thousands of guests, including politicians, movie stars and newsmakers alike: Franklin Delano Roosevelt, John F. Kennedy, Robert Kennedy, Martin Luther King Jr., Harry Truman, Al Jolson, Bob Hope, Malcolm X, Milton Berle and Bing Crosby among them.

Gray was no stranger to controversy: His defense of black performer Josephine Baker against powerful columnist Walter Winchell in the 1950s nearly cost him his life and much of his career. Twice Gray was beat up on the streets of New York after his overnight radio show.

"He was a great showman," said Rich Wood, director of the WOR Radio Network. "Nearly everyone looked up to Barry Gray ... To the last show he did, he sounded terrific. It was a rare privilege to have worked with someone like Barry. He'll be missed terribly."

Gray is survived by his wife, Nancy Kellogg Gray, a two-year-old daughter Dora Grace, and grown children Michael and Melodie.

"I really feel like I lost him twice," said Nancy. "I lost him as the public person he was, whom I admired greatly, and I lost him as my husband and the father of our child. I not only loved him so much, but I just respected what he stood for and I certainly don't want those things to die."

Contributions in Barry Gray's memory can be made to the Museum of Television and Radio, 25 West 52nd Street, New York, N.Y. 10019.

DAR Report Slammed

► DAR, continued from page 1

He said an attempt had been made to gather data in the Presidio, but there were problems with the data collection.

CBS Radio Vice President of Engineering Glynn Walden said USADR testing had shown that L-band systems do not perform well in indoor testing — their building penetration is weak — and hence, "Eureka did everything they could over a period of time to see to it that no indoor testing would take place ... Ultimately, they won."

The nominees are ...

The draft report claimed that the IBOC systems "showed unimpaired audio quality judged 'very annoying' compared to the reference CD quality." More devastating to the IBOC systems, however, was the evaluation that they "caused an unacceptable degradation in the host stations' reception quality."

Prior to the commencement of field testing, USADR President and CEO Bernee Strom repeatedly decried any mention of "compatibility" problems, giving live on-air demonstrations of the system that did not summon any complaints from station operating personnel or listeners (see *RW*, Sept. 20, 1995).

The validity of the field test data report is undermined, if not null and void, in the minds of Strom and Walden, because USADR withdrew its system before field testing began. Strom, in fact, claimed that her company was told that the lab test data on its system would only appear in the field report as an appendix.

"Our position is that our data shouldn't be included," Strom said. The company has abandoned that early version of the system, she said.

The report dismisses the AT&T/Lucent system because it "has limited potential coverage due to presumed placement on frequencies subject to widespread first-adjacent and second-adjacent interference from existing FM broadcast signal levels."

The VOA/JPL satellite system was ruled out because of "extensive signal blockages and resultant audio failures (or mutes) caused by buildings, signs, trees and other foliage." Messer said the evaluation was better than he expected. "There's no question," Messer said, "if you have a very low-powered satellite system such as we were able to get — 7 W — and a very low elevation angle — 20-some-odd degrees — you're going to be blocked a lot of times." The system experienced this, Messer said, in the downtown and perimeter areas of San Francisco.

Walden said the report actually shows that the satellite proponent outperformed Eureka everywhere except in downtown San Francisco. Likewise, Messer pointed out in his letter to Brunts, "... the draft report leaves out totally the fact that the VOA/JPL system consistently performed 3 dB or so better than Eureka-147 with noise impairments."

And the winner is ...

Walden blasted the performance of the Eureka system, saying, "No broadcaster, nor anybody, would buy a receiver that's muted 10 percent of the time."

However, the report praised the Eureka system, concluding it "offers the audio quality and signal robustness per-

formance that listeners would expect from a new DAR service."

The IBOC proponents said that evaluating their system alongside an L-Band system is like comparing apples and oranges.

Messer wrote to Brunts, "... it is terribly inappropriate to say, without any attempt to display the subtleties, that system x is better than all other systems."

In fact, an appendix in the lab report indicates that the difference between the Eureka system and the next best performing one is statistically insignificant: "... If (the systems) differ by less than 0.17, this difference is not considered statistically significant since it could too

easily be due to chance."

Walden questioned the integrity of EIA and its testing, saying, "It's not an independent, non-biased testing body ... The whole process is slanted towards Eureka."

NAB comes out against the report

Like the EIA, NAB had originally endorsed the Eureka system, but opposition from the organization's constituents forced it to recant.

NAB, in keeping with the stated position of its board members, supports an IBOC solution for DAB in the United States, as it awaits improvements to the on-channel systems in order to facilitate another round of testing.

In a letter to Brunts, a senior engineer at NAB condemned the draft report, calling it "misleading, incomplete and over-

all serves to trivialize the entire test process."

The engineer suggested that the report be rejected and, if a better version cannot be drafted, that further analysis of the test results be abandoned.

Westinghouse Wireless Solutions has agreed to assist USADR in finding solutions for the interference and multipath problems it is experiencing with its system.

Strom said her company will be ready to demonstrate its new and improved system next year.

On the NAB offer to test the systems, Strom said, "we welcome participation by the NAB, but it has not yet been determined who will do the testing."

An official statement from CEMA on the performance of the systems had not been made available at press time.

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Circle (5) On Reader Service Card

Liquor, Airtime on Hill Agenda

by Lynn Meadows

WASHINGTON As the 105th Congress gets down to business, it will address several issues that concern radio. Over-the-air liquor advertising, campaign finance reform and spectrum auctions are three items on the agenda sure to keep the lobbyists of the National Association of Broadcasters occupied.

Subcommittee agenda

After John McCain, R-Ariz., was named chairman of the Senate Commerce, Science and Transportation committee, the chairmen of the six subcommittees were announced.

Conrad Burns, R-Mont., is the new chairman of the Senate Subcommittee on Communications. That position had been filled by Sen. Larry Pressler in the 104th Congress. Pressler, who also chaired the full Senate Commerce Committee, chose to consider items like the Telecommunications Act at the full committee level.

A spokesman for Burns said McCain has indicated he will give all the subcommittee chairmen a "fairly long leash." He said Burns planned to use the subcommittee to oversee implementation of the Telecommunications Act and said if questions about radio mergers arise, the subcommittee will be an appropriate venue to discuss them.

At the top of Burns' agenda, however, were hearings on over-the-air liquor advertising. Those hearings, expected to be wide-ranging, were tentatively scheduled for Feb. 11.

Alcohol advertising came under scrutiny last year after Seagram advertised a distilled spirits product on a Texas television station in June. The Distilled Spirits Council of the United States subsequently

abandoned its 60-year-old voluntary ban on such advertising.

Rep. Joseph Kennedy, D-Mass., introduced two alcohol-related proposals last year. In May, he proposed legislation that would ban "cutesy" beer and wine advertisements on television during the hours that children might be watching. After the Seagram ads aired, Kennedy introduced his "Just Say No Act" to ban all advertising of hard spirits. Kennedy planned to reintroduce that legislation this session. Hearings were scheduled by the House Subcommittee on Telecommunications, Trade and Consumer Protection under the leadership of Billy Tauzin, R-La., earlier this month.

Burns' spokesman said the Senate hearings on liquor advertising would not focus on any one piece of legislation. He said he expected an open discussion of issues from hard liquor advertising to beer and wine advertising to the First Amendment.

Radio and campaign reform

Campaign finance reform promises to be another hot topic. A measure introduced in the previous Congress by Sens. McCain and Russell Feingold, D-Wis., failed. This Congress contains 15 new senators, and Feingold is optimistic about the bill's chances this session.

"Many of them may not prefer our bill," he said of the new senators in a speech, "but I'm sure almost every one of them just got done telling their constituents that they're for campaign finance reform and they're for partisanship."

A spokesperson for Feingold said this year's proposal — the Bipartisan Campaign Reform Act, introduced Jan. 21 — is virtually the same as last year's, except that the new version includes a restriction on foreign campaign contributions.

The NAB is rankled by provisions in the bill for free or reduced-rate over-the-air advertising. The bill provides three specific benefits to Senate candidates who voluntarily agree to limit their campaign spending:

- Every eligible candidate would receive 30 minutes of free prime time television time during the general election period. Candidates could use the time in 30-second to five-minute intervals, although no candidate could request more than 15 minutes of free time from any single broadcast station.
- Candidates who limited their spending would receive a 50-percent discount for all other advertising time purchased 30 days before the primary election and 60 days before the general election. Except for situations beyond their control, broadcast stations could not preempt any time purchased by an eligible Senate candidate.
- Eligible candidates could get discounted postal rates for some mailings.

To qualify for the discounts, candidates would have to limit voluntarily their overall campaign spending and their own personal spending on their candidacy. The candidate would also have to agree to raise 60 percent of his or her campaign funds from individuals in his or her home state.

An NAB spokesman said the organization's members already play a major role in furthering the national dialogue with their nightly news election coverage, free public affairs programming and coverage of political debates.

"We cannot support confiscation of broadcast air time to perpetuate negative political attack ads," he said.

Spectrum auctions

As soon as he became chairman of the Commerce Committee, McCain informed FCC Chairman Reed Hundt that he will introduce legislation authorizing the FCC to auction broadcast licenses. A spokesman for McCain said the senator expected to introduce that legislation this month or next. It appears the legislation will apply only to analog broadcast licenses, which means the question of digital spectrum allocations remains open.

A spokesman for the NAB said the association has never supported the concept of auctioning any of the broadcast spectrum, be it analog or digital.

McCain also is anxious to confirm

WMTA Asks Justice Dept. For Help

► WMTA, continued from page 8

has a 100,000-watt transmitter, Central City may be the Evansville market."

A spokeswoman declined to comment on the Central City case, saying only, "We're aware of the concerns and will take the appropriate course." The spokeswoman was similarly closemouthed about whether or not the DOJ is looking into other small market cases, saying, "We will open investigations where appropriate. We're watching the industry closely."

An FCC engineer said that the commission would ask the two parties to resolve the dispute between themselves. If they cannot compromise, then the FCC would intervene. Factors that the commission would consider in deciding who should get the license include which station serves the highest population and if one station is a fill-in.

Smeathers said he had drafted a letter to Starlight asking that it resolve the controversy by applying for another frequency, but at press time he had not received a reply.

For Smeathers, the question remains, will the Justice Department get involved before it is too late for the small-market, stand-alone broadcaster? Said Smeathers, "We will soon be dinosaurs if this isn't addressed."

replacements for FCC Commissioners Andrew Barrett, who resigned last spring, and James Quello, who has announced his plans to resign before summer.

Anyone interested in contacting their congressional representative about any issue should consider using the Internet. Both the House and Senate have web pages that list the e-mail addresses of most members of Congress. Those site addresses are www.house.gov and www.senate.gov



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You Read It Here...

One Year Ago

"Along with many other juicy tidbits, the Delphi Forecast Study recently released by the NAB reports that the traditional disk jockey will soon be an endangered species.

"But the bottom line (of the study) is if radio wants its own lane on the Information Superhighway, stations must head for the on-ramp quickly."

— News item
 March 6, 1996

Five Years Ago

"The NAB Joint Board's recent decision to pursue development of in-band digital audio broadcasting (DAB) has been greeted enthusiastically by industry insiders ...

"The decision can be considered a victory for in-band advocates, who had criticized the NAB for attempting to negotiate a licensing agreement for Eureka technology."

— News item
 Feb. 19, 1992

Fifteen Years Ago

"When CNN Radio debuts on April 1, 1982, it will take off from a point that most networks take a decade to reach. The moment it goes on the air it becomes an established member of the Turner family of proven performers whose newsgathering services have been honed in the field and tested in over 20 million homes."

— Frank Beatty
 National Sales Manager
 March 1982

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World Radio History

Country Music Boosts St. Jude's Hospital

by Susan Gary

MEMPHIS, Tenn. The annual "Country Cares for St. Jude Kids" launched its eighth radiothon season Jan. 17 and 18 in Memphis, Tenn. According to spokeswoman Tina Rajski, the weekend served as a pep rally of sorts, with celebrities and representatives of radio and the country music industry touring St. Jude Children's Research Hospital, and attending seminars and a kick-off dinner.

"Country Cares" began in Nashville at the 1989 Country Radio Seminar, as a challenge to the country music industry by Randy Owen, lead vocalist for the award-winning country band Alabama. Owen encouraged the industry to support St. Jude's, which "treats all children regardless of their ability to pay." The fundraiser has since grown to national proportions, encompassing the country music industry from the artists and record companies to radio personalities and more than 150 large-market radio stations.

With the weekend in Memphis as a starting point, each radio station chooses a weekend and sets up its own publicity campaign to generate listener support for its own radiothon.

"Some stations go to a mall and set up live broadcasts. Others go to grocery stores and others sponsor call-ins directly to their station," said Rajski. Several country music stars are scheduled "to provide sound bites for radio stations to use to promote and to attract support."



Randy Owen is shown along with St. Jude Children's Research Hospital patient Amanda Armstrong. The 11-year-old was diagnosed with orbital osteosarcoma of the right eye.

Rajski said this year's goal is simply to exceed last year's \$12 million and to continue to grow.

The track record for "Country Cares" certainly points in that direction. The event has grown an average of 43 percent per year since its inception, peaking between 1990 and 1991 at a 116 percent increase in funds raised.

Radio helps out

Country music stars Aaron Tippin, Brian White, Kenny Chesney, Deana Carter and Owen were among the many at this year's event who interacted with St. Jude patients, listening to their experiences of living with and surviving childhood cancer.

On the second day, radio representatives who have organized successful radiothons led instructional seminars describing the "how-tos."

Mae Daniels of WMZQ-FM Washington led a roundtable discussion on the "nuts and bolts" of holding a successful radiothon. Keith Gale of RCA in New York, George Bruner of Curb/Universal in Nashville and Phyllis Stark of Billboard presented a briefing concerning the St. Jude's Nashville office, which works with record labels, songwriters and artists to generate support for the radiothons.

Dale Carter of KFKF-FM in Kansas City, Kan. instructed the attendees on how to do on-air appeals; David Isenberg of KSAN-FM in San Francisco covered sponsorship opportunities. Mark Levy of WQXK(FM) in Youngstown, Ohio showed attendees how to create "win-win situations," and Rick Everett of WCTK(FM) in Providence, R.I. suggested some side events that would make radiothons more interesting. Rajski said the sessions culminated in a "brainstorm of ideas," with participants swapping proposals and suggesting publicity campaigns.

The stars, including Crystal Bernard of television's "Wings," met with patients and listened as they talked about their experiences at the hospital.

They "focused on what the hospital has done," Rajski said. Singer Kevin Sharp, himself a cancer survivor, also met with patients. According to David L. McKee, senior vice president of field operations for St. Jude's, "a little boy requested that he sing 'Amazing Grace.' It was quite an emotional moment for everyone."

Randy Owen stated in a press release, "The people of country music, from fans to the DJs to the artists and the record labels, are incredible. Because of them, St. Jude Hospital is making a difference in the fight against childhood cancer."

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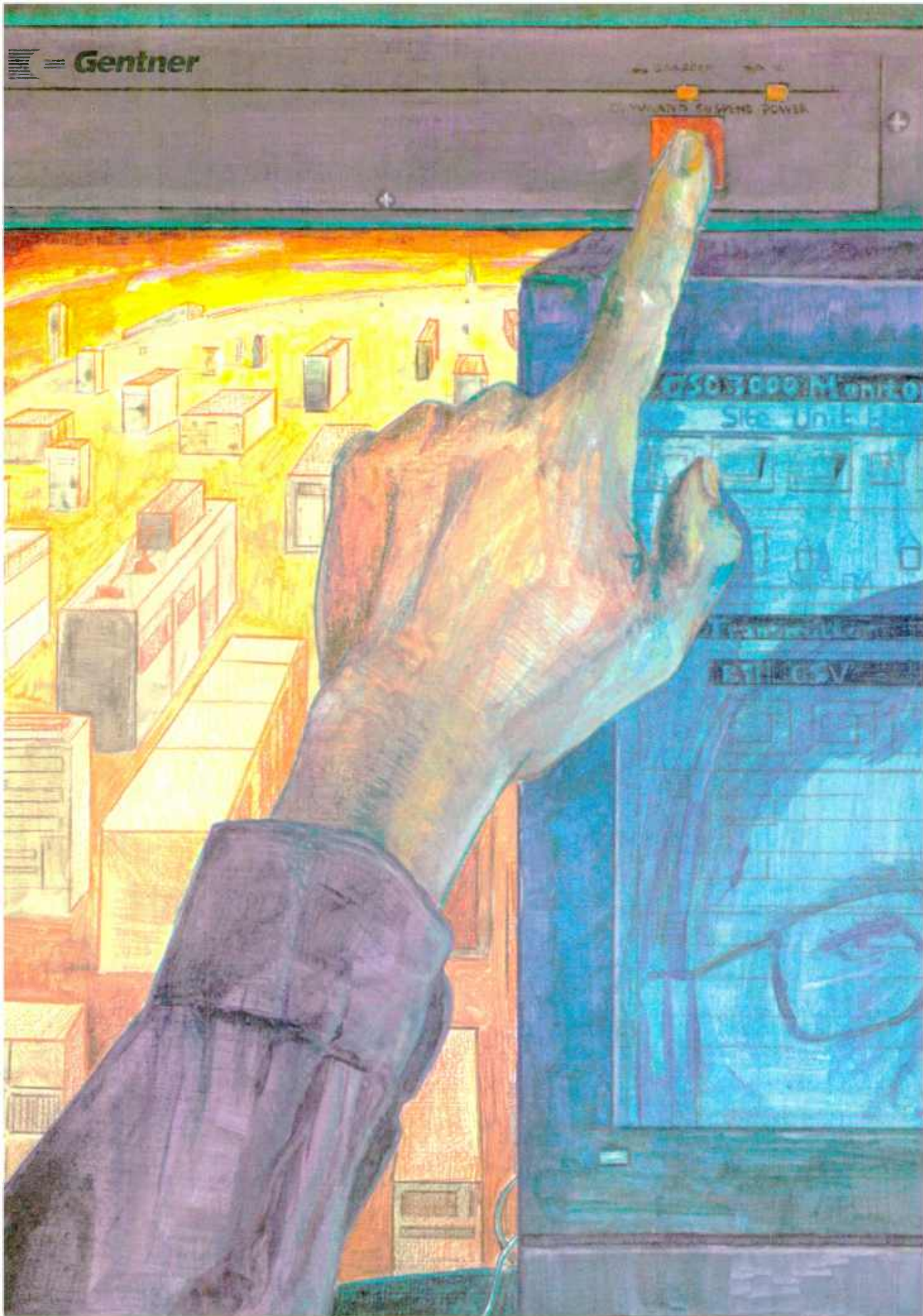
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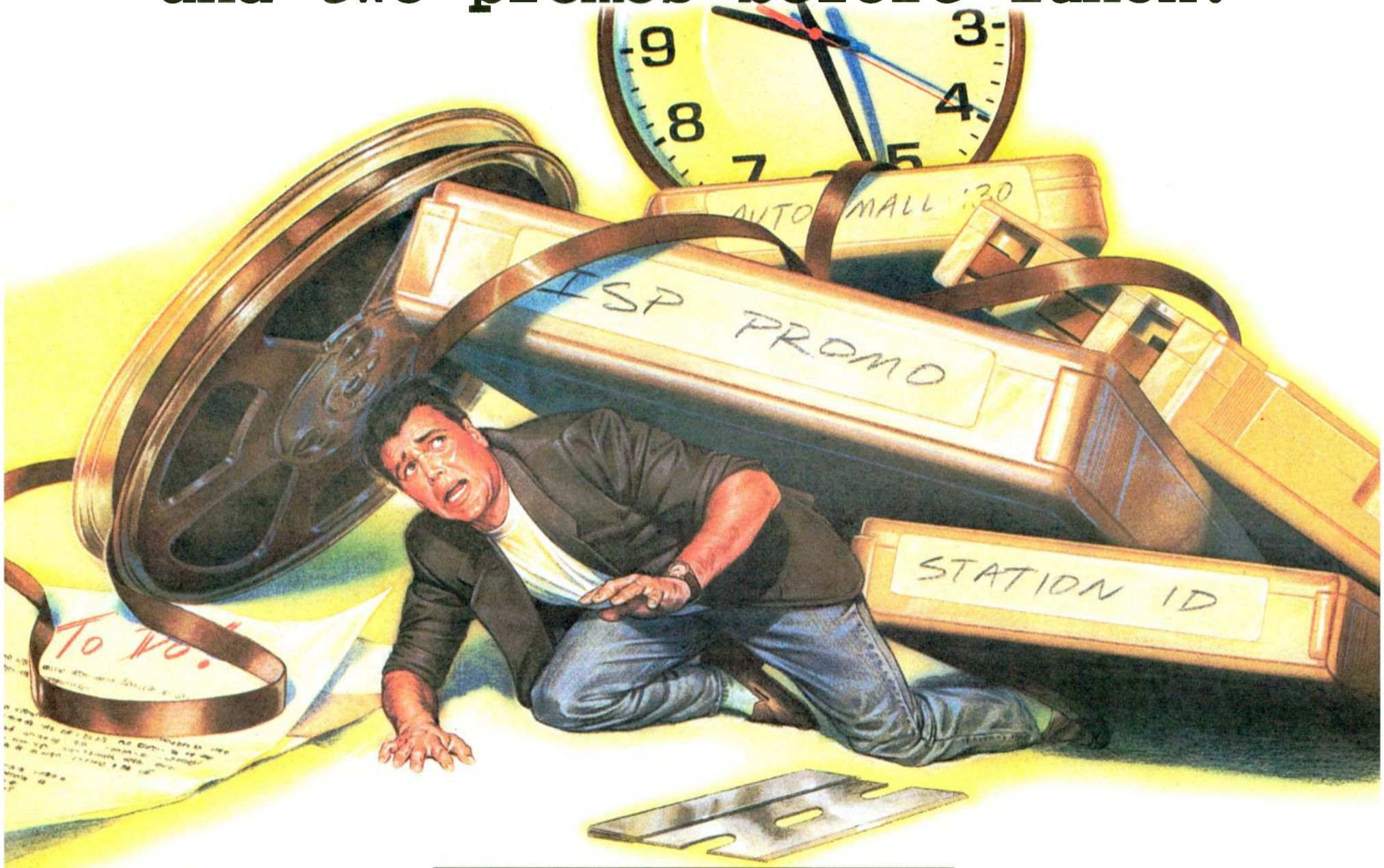
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Circle (17) On Reader Service Card

World Radio History

Safety Is Well Worth the Cost

Troy Conner

This month I would like to discuss a topic near and dear to any tower climber: fall protection. More specifically, I'd like to briefly address tower climber safety systems.

First let's look at some sobering statistics. According to the National Safety Council, every year, more than a quarter-million American workers are disabled in work-related falls. Additionally, falls are the second-highest cause of death in the workplace. Only motor vehicle-related accidents kill more Americans on the job.

According to the Department of Labor, falls are one of the leading causes of death on the job.

Within the construction industry, falls rank as the leading killer. Fortunately, most tower workers are extremely safety-conscious. They realize that they alone ultimately are responsible for their personal safety and un-pancaked persona. Fall protection must be an integral

portion of all tower work.

A typical climbing safety system consists of a tensioned steel cable or rail spanning the entire height of the structure, a traveler or sleeve that rides the cable or rail, and a safety belt or harness. It allows a climber to ascend or descend the tower normally, but in the event of a slip, the traveler or sleeve locks down on the cable ... preventing all but a short, controlled fall.

Prescribed safety

Climbing safety systems are prescribed by a number of overlapping federal agencies. As best I understand them, they are as follows: The Telecommunications Industry Association and the Electronic Industries Association new standard TIA/EIA-222-F "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures," released in June of 1996, states that "climbing safety devices shall be provided when

specified by the purchaser."

The standard further specifies, "Climbing safety devices shall meet the design requirements of the American National Standards Institute (ANSI) A14.3-1984, "Safety Requirements for Fixed Ladders," Section 7."

Hence, the TIA/EIA seemingly places the responsibility for specifying a safety system upon the purchaser (owner) and defers to ANSI with regard to actual design and specifies, ANSI A10.14-1991 is also applicable to harnesses and ladder safety.

Also involved in the legislation of ladder safety are the Federal Aviation Administration and the Occupational Safety and Health Administration. The applicable directives are presented in FAA RRS-001301 and OSHA Federal Registers 1910.27, 1926.502-1995, 1910.66-1989 and finally 1910.128-131. Whew!

Unfortunately, I am not the scholar of all these rules and regulations that I should be. Therefore, I cannot fully explain the interrelations between the various regulations or the involved regulating agencies. It is a quagmire befitting bureaucracies.

What I do know is that most of these regulations have been in place for quite some time. It is my understanding that, generally, safety regulations are both proactive and reactive, meaning they contain no "grandfathering" clauses or exceptions.

I estimate that 80 or 90 percent of the older towers I climb lack safety cables. Stunningly, more than half of the relatively new structures also lack them. I find this appalling.

Perhaps my perspective is tainted because it's my a** up there. I have heard of safety cables jokingly referred to as chicken wires by those in my field — but the older I get, the more reassured I am by the sight of that 3/8-inch cable. This is particularly true in icy or wet



Man of Steel

conditions. As one of my employees put it, "You have to be willing to climb the beast without it, but when you see a tower with a cable, you still breathe a sigh of relief."

A minor expense

Ultimately, tower owners must assume some degree of responsibility for the safety of those contracted to work on the structure. God forbid, but accidents do happen. Imagine the legal and financial liability in the event of an accident were the tower to be found to be lacking a prescribed safety climbing system.

In terms of cost, a climbing safety system truly is a negligible expense in the grand scheme of things.

The equipment to retrofit a small tower is available for \$500-\$600 and the largest can be fitted for \$2,000-\$3,000 worth of hardware. Cost of labor will vary, but probably will about equal the cost of the equipment.

It has to do with safety, so as one engineer said when I queried him about a proposed safety system and his budgeting efforts with management: "It's a no-brainer."

■ ■ ■

Troy Conner is the owner of Tower Maintenance Specialists. Reach him by phone at (704) 837-3526 or via fax at (704) 837-1015.

Put Your Older FM Transmitter to Work

James F. Pinkham

Radio people find old transmitters to be a source of nostalgia and memories. But these workhorses can be more than that. Older transmitters retain a role in today's radio station.

When the frequency modulation band moved to 88-108 MHz in the late 1940s, the only technology known was monaural transmission. Some of the older transmitters of that era, built by RCA, GE, Gates and Westinghouse, lacked bandwidth. To the extent that they survive to this day, they are probably used as auxiliary equipment.

Harkins and Hirschfield in Mesa, Ariz., pioneered the development of sub-carrier for FM, and fought it through the courts and the commission, with Muzak Corp. of "wired music" renown fighting them every inch of the way.

Upon their success, the advent of SCA made possible, in fact assured, the survival and eventual supremacy of FM as a medium. It mandated a significant improvement in FM technology, particularly bandwidth, to make possible up to four sub-carriers on the FM station, and also made possible the most significant improvement in radio as an entertainment medium: stereo broadcasting, requiring two of those sub-carriers.

FM stations that once broadcast classical fare without the luxury of commercials found themselves overnight equaling or exceeding the popularity of AM radio, once car radios could receive both AM and FM-stereo signals.

Digital technology has revolution-

ized the recording of music, but on today's radio playing field, it still needs FM carrier to get away from the bursts of lightning and atmospherics.

Time has brought us a new generation of transmitters and manufacturers.

GE dropped out of FM and TV transmitters, and Westinghouse dropped out of all but military transmitting equipment. RCA and Gates/Harris were joined by new companies. Continental (previously military) later merged with Collins.

AEL, ITA, CCA, Singer, Bauer, Sparta, McMartin, Wilkinson, QEI, CSI, Broadcast Electronics, Energy-Onix, to name most, brought a new generation of solid-state synthesized FM exciters, new broadband RF amplifiers, and eventually solid-state amplifiers up to 5 kW with hybrid combiners. Nautel from Canada has a

solid-state FM line. A large number of these companies are no longer in business, including RCA, AEL, ITA, Singer, Bauer, Sparta, McMartin, Wilkinson and CSI.

How to decide

Now that FM has become the outstanding broadcast medium, the modern, prosperous FM station should have back-up equipment. The digital age has taken over the areas of audio programming and station control. (I will not delve into the computer aspects of modern broadcasting in this article.) Many prosperous stations today are investing in medium- and high-power solid-state amplifiers up to 4 kW and more, and synthesized solid-

If you require over 5 kW, one-tube transmitters are attractive, economical solutions.

See OLD FM, page 20 ►

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FEED LINE

Use the Proper AM Hardware

W.C. Alexander

Part IX

In the Jan. 8 issue of *RW*, we began a discussion of transmission line in AM antenna systems. We continue that discussion here.

Characteristics

Several properties determine the suitability of a given line for a particular application. These properties are published in charts and graphs provided by the manufacturers of such lines. Every engineer should keep several transmission line catalogs handy. In addition to line ratings, they contain all kinds of other useful engineering information.

Impedance is one of the most important properties of a transmission line. The value of transmission line impedance is determined by the size and spacing of the inner and outer conductors as well as the dielectric constant of the dielectric material between the conductors. Most lines in use today are rated at 50 ohms, although I have measured the impedance of such lines to ± 10 percent of the nominal rated value. 75 ohms is a common impedance value in older systems, particularly AM systems. Occasionally, transmission lines with characteristic impedances of 51-1/2 ohm, 52 ohm, 63 ohm and even odder values can be found in older installations. For all practical purposes, unless you are replacing an older line and there is some compelling reason to use an odd-impedance line, 50 ohm is likely to be the desired impedance of any line purchased today.

The *power handling capability* of a transmission line is absolutely critical to its proper selection and safe use. It is limited by either the maximum peak power (determined by the electric field strength and dielectric constant) or the maximum average power (determined by the allowed temperature rise of the inner conductor).

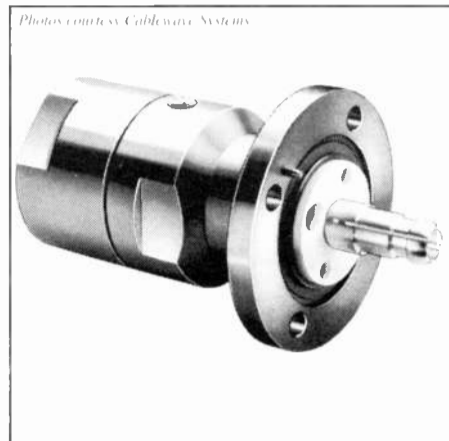
Using the manufacturer's supplied ratings, you can tell at a glance what the average and peak power capabilities of a given line are. What takes more than a glance to determine is whether a given line size is suitable for a given application. A look at just about any manufacturer's power rating graph will also show that the peak and average power ratings tend to converge at lower frequencies so that at AM frequencies, where skin effect is minimal, they are the same.

Derating. Consider an AM station that needs to replace the transmission line to one of its directional array elements. Let's assume that there is normally 10 kW of power flowing to that particular element. According to the manufacturer's published ratings, 7/8-inch foam dielectric line is capable of safely handling 44 kW. That should be plenty of safety margin, shouldn't it? Let's look closer.

If we're going to modulate the power being fed to the DA element 100 percent positive, the peak power will be equal to 40 kW. That's getting pretty close to our 44 kW rating. If we allow for 125 percent positive modulation, our peak power is over 50 kW, well above the peak power handling capability of the transmission line.

Another variable for which we must

allow is VSWR. In any real-world situation, even in the best matched system, the VSWR on a transmission line will at times be higher than 1.0:1. This can be due to ice, changing ground conductivity, defective ATU components or a number of other factors. In choosing a transmission line, always allow for 2:1 VSWR.



EIA Flange Connector

This will provide an adequate safety margin in most cases.

The formula for derating a transmission line for VSWR and modulation is as follows:

$$P_D = \frac{P_{PK}}{(1 + M)^2 \text{ VSWR}}$$

Where:

P_D = Transmission line derated power
 P_{PK} = Transmission line rated peak power
 M = Modulation percentage as a decimal

Using this formula, you can compute that our 7/8-inch foam line, rated at 44 kW peak power, is only good for a little over 4 kW! Take my word for it. At a station here in Dallas, this very scenario played out and produced a burned up, brand new transmission line. If I had my way, manufacturers would overlay this formula in red on their power rating tables and graphs!

Attenuation is another important line characteristic. It is caused by a combination of the I²R losses of the copper and the dielectric losses of the dielectric material. The losses in the dielectric material tend to be directly proportional to the frequency. Conductor losses are related to the dimensions, permeability and conductivity of the material and tend to vary with the square root of the frequency.

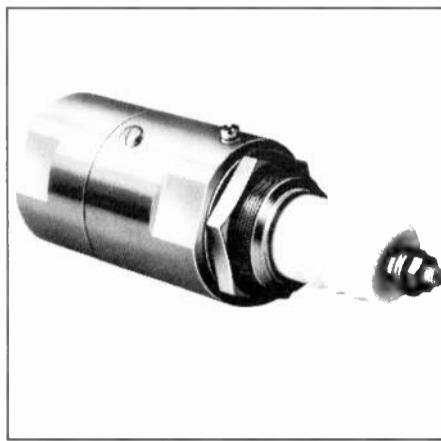
While the rated attenuation of a transmission line is very significant at FM and TV frequencies, it is seldom significant at AM frequencies. Line losses are so low in a typical AM system that they can be ignored altogether, provided that the transmission lines are otherwise adequately rated.

Fittings

Many types of fittings and terminations are available to allow us to make the transition between the coaxial transmission line and RF sources and terminations. The end terminal adapter is in common use at AM frequencies. This device creates an airtight seal to the transmission line and provides a brass stud connection for the center conductor. The body of the fitting is

equipped with threads and a nut for the ground connection. On air-dielectric lines, a gas port is provided on the fitting to facilitate pressurization or purging. By far, this is one of the easiest means of connecting the tubing in a phasor or antenna tuning unit to the transmission line.

LC-type connectors were once popular



End Terminal Connector

at lower power levels for lines up to 1 inch in diameter. This is a coaxial screw-on fitting very similar to the PL-259 connectors used on RG-8 cable.

EIA flange connections are very popular means of line termination. The outer conductor of the flange bolts onto the chassis of the equipment, and the center conductor is attached with a "bullet," which is a spring-loaded expansion con-

ductor that fits inside the center conductor. EIA flange terminations for air dielectric lines provide a gas port. None is needed on foam line terminations. Rigid transmission lines almost always terminate in EIA flanges, although adapters to end terminals and other types of fittings are available.

When choosing the fitting to use on a transmission line, consider the connection provided by the equipment manufacturer. Obviously, the two must match. In high altitude situations, the end terminal adapter may be a better choice than the EIA flange because of the larger spacing between the stud at the end of the terminal and the body of the connector. EIA flanged connections are prone to arc over in high power situations at high altitude, where the air ionizes more easily.

Choosing a transmission line is more difficult than simply picking up a catalog and selecting a line that looks like it will work out. Any predisposition to use a certain type of cable at a certain power level must be forgotten. Keep your calculator handy and figure in all the variables I have presented here. Just because the broadcast equipment dealer or another engineer recommends a particular size and type of line, don't take his word for it without doing some figuring on your own. The optimal choice may be something entirely different.

■ ■ ■

This is one of a series of articles about AM antenna systems.

Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. Contact him at (214) 445-1713 or via e-mail at 76440.1670@compuserve.com

Work Old FM Boxes

► OLD FM, continued from page 19

state exciters are standard equipment.

If your station's transmitter power output requires over 5 kW, one-tube transmitters are attractive, economical solutions. With the older transmitters, space was a serious problem. If you have adequate equipment space in the transmitter room (or even an alternate emergency site), an older unit may be a valuable asset for back-up operation as an alternate main, or auxiliary unit. The latter does not require the same performance specifications, as it is only licensed for emergency operation when the main transmitter has failed. The auxiliary transmitter should be dependable, stable in operation and readily remote-controlled.

Larger transmitters, such as 25 kW models, usually require three-phase (wye or delta). Chances are, your station is already equipped for three-phase if you are currently using 25 kW equipment. In the 1970s and '80s, CCA and CSI both manufactured 25 kW two-piece transmitters comprising a 3 kW driver (complete with 50 ohm output, EIA 1-5/8 line) and 25 kW power amplifier. CCA makes such a model in their present line.

These systems used grounded-grid RF amplifiers. (See related article by Tom Vernon in *RW*, July 10, 1996, page 13).

With the low-power driver (3 kW) tuned to about 1,800 to 2,000 W into a 5 kW test load, the 25 kW amplifier was then tuned to optimize operation

at the desired power level. It was very important to tune the low-power driver into a test load, and leave it alone! Re-tuning the driver would produce a mismatch between the driver and PA. The driver was factory-tuned for 50 ohms out.

A field change to another frequency requiring the re-tuning of the driver should be done with a 5 kW test load, and coax adapters, to optimize on the new frequency. Then, the PA can be tuned and loaded for output power on the new frequency.

To sum up, a used but serviceable older transmitter, especially one of the grounded-grid types, may be a very good investment if you have space and power available. Remember that the apparent poor efficiency of the "G-G" system is an illusion. The drive power in a 25 kW — about 2,000 W — shows up in the output of the 25 kW final amplifier.

This means that in order to produce 25 kW to the antenna, you typically must only produce 2,000 W drive and 23 kW PA stage output power, which combines in the output reflectometer as 25 kW. None of the 2,000 W drive is wasted.

■ ■ ■

James F. Pinkham has been a control systems designer and consultant since 1960, associated with Multronics Inc., Mullaney Engineering Inc., CSI Electronics Inc. and other manufacturers. Contact him at (518) 822-9425 or via e-mail at jimpink@aol.com

Become an Israeli Media Mogul

Lee Harris

Want to invest in international broadcast properties? You don't need a high-powered broker and a multibillion dollar line of credit. All you need is Internet access and perhaps a willingness to raid your IRA.

I discovered this startling fact recently while perusing the *rec.radio.broadcasting* newsgroup on the Internet. Buried among the usual complaints about right-wing talk show hosts and news about personnel changes in the Missoula market was a posting with the header "Investor wanted for radio station." Although I still have post-traumatic stress disorder from my own days as an owner-operator, I couldn't stop myself from taking a peek.

A pirate looks at 20

Shmulikb@netvision.net.il was making the following offer. For \$9,000 you too could own a "substantial portion" of a new radio station in Israel. Because nine grand doesn't even buy a substantial portion of a mid-size car these days, I was intrigued. I fired off an e-mail to Shmulikb, requesting specifics. A few hours later the surprising details arrived in my e-mail box.

Shmuel Blacher is an 18-year-old Israeli, who up until a few months ago was the manager of "Radio Activy," a commercial pirate radio station serving the Tel Aviv area. As Shmuel explained it, the 500-watt FM station operated for more than two years without government interference, 24 hours a day, selling airtime, and even maintaining studios in a major office building in Tel Aviv. The format consisted of popular music with live contests, and a daily, one-hour local newscast, all in Hebrew. While Radio Activy kept a much higher profile than U.S. pirates, it enjoyed many of the same benefits, including non-payment of taxes and music royalties.

This arrangement was great for the bottom line. In his first e-mail, Shmuel explained that the station was "very successful and very profitable," despite the 30 percent commission to which the station rep firm was treating itself. Without getting into specifics, Shmuel noted that the station's advertising rates were very high and at times surpassed those of national stations.

Radio Activy was practically minting money, Shmuel explained, until the Israeli Ministry of Communications decided to allow local stations to operate legally. Up until this point, the Ministry had been turning a blind eye to the pirates, but the large quantity of Israeli shekels changing hands apparently proved too tempting to the government. A new licensing procedure, complete with a large fee, was put into effect and all pirates were ordered off the air. Despite its profitability, Radio Activy was not in a position to go legit. After notifying its advertisers of its pending demise, Radio Activy said good-bye to its listeners with a special farewell broadcast.

Freed from the pressures of day-to-day broadcasting, Shmuel had time to consider his options. Suddenly it occurred to him that a lot of Israel wasn't really under Israeli control these days. Plan B called for keeping studios in Tel Aviv, but

putting the transmitter in the "occupied territories" or the Palestinian-controlled areas, somewhere beyond the reach of Israeli communications law. The only thing standing between Shmuel and the re-birth of Radio Activy was the \$9,000. And by the way, said Shmuel, that measly 9K would buy a full 50 percent equity in the operation. Tell me more. I anxiously replied via e-mail.

In his follow-up e-mail, Shmuel explained that the station had the necessary studio equipment, including an eight-channel stereo mixer, a few CD players, a MiniDisc machine for spots, plus a few microphones. The investor's money would go to purchase a 100-watt

transmitter (operating at 102.6 MHz), an antenna with 5 dB gain and a studio-transmitter link. Although the top of the rate card was only \$13.30 for a 30-second spot, the financial projections for Radio Activy were quite rosy.

Big plans

After two months of operation, Shmuel predicted that the station would be billing in the neighborhood of \$65,000 per month, with cash-flow of about \$15,000 per month. By my calculations, this meant a rate of return in excess of 800 percent for the first year. Somewhere in the recesses of my mind, Zero Mostel was singing "If I Were A Rich Man"

while Shmuel fiddled away on the roof of some office building in downtown Tel Aviv. Shmuel, where were you when I was blowing my life savings on a decrepit Class IV AM in rural Wisconsin? Probably in third grade.

After a few years of raking in the cash, Shmuel allowed that Radio Activy might actually go ahead and apply for one of those expensive official licenses. It was a different story with Akum, the Israeli equivalent of ASCAP, BMI and SESAC all rolled into one. Shmuel planned to start paying them after three weeks.

I wrote back, expressing my concern, as a former owner-operator, that this operation might be a little under-capitalized. Shmuel assured me that per his proforma, it was not, and he was anxious to get a commitment for the nine grand, as

See MOGUL, page 29 ▶

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Hear the Sound of Capacitors

Jim Somich

Capacitors and quality audio have never been the best of friends. Studies claim that each type of capacitor imparts a subtle distortion to audio passing through. Even power supply filter caps contribute distortion because the power supply path is really part of the audio path.

Electrolytic capacitors tend to be the worst offenders, with disc ceramics and tantalums not far behind. The best audio caps are the film types: mylar, polyethylene, etc. Double-blind listening tests tend to confirm this fact. The determining factor seems to be the dielectric material used in the capacitor. The dielectric is the insulating layer between the plates of the capacitor.

In many circuits we can replace electrolytic caps with film types, but in higher values and voltage ratings the film caps tend to be large and expensive, so this is seldom done. Film capacitors bridging power supply filters will improve the sound of any audio device. Use the highest practical value and watch the voltage rating. Unfortunately, no film cap has enough capacity totally to replace an electrolytic cap.

The dielectric in an electrolytic cap is a micro-thin film created by the electrolytic action between an aluminum foil plate and a chemical paste. The paste then forms one plate of the cap with the foil the other. The thinness of this film and its relatively high breakdown point make electrolytic caps cost- and size-effective. No other capacitor type can pack so much capacitance at such a high breakdown voltage into such a small, inexpensive package.

Most audiophiles would shudder at the thought of electrolytic capacitors in the signal path of an amplifier. Yet the practice is common in professional devices. Your audio may pass through dozens or hundreds of 'lytics, each one imparting a little distortion to the signal. And you will seldom find film caps bridging power supply filters in pro gear.

Electrolytic capacitors are polarized devices, with a positive and negative

terminal. When properly polarized, the cap performs its function of holding a charge. Reversed, the cap becomes almost a short circuit. In a power supply, a reversed electrolytic will burn up.

What happens when we insert this polarized device into an audio path that is, by nature, bi-polar? On the surface, nothing. But listen more closely. The sound is smeared slightly. Subtle distortions have been created.

The cap is storing a small charge when forward-biased (positive audio signal feeding positive cap input terminal). The magnitude of this charge is determined by input level, frequency, capacitor value and voltage rating.

When the audio signal changes polarity (as it does with every audio cycle) the cap continues to remain at the same polarity for a brief nano-second. In effect, it is holding a charge. This hysteresis distortion is similar to the crossover distortion in a poor class-B amplifier stage. Crossover distortion in class-B amplifiers results when the audio signal changes polarity and one device in a push-pull stage is "turned off" and the other "turned on." Careful attention to design can reduce crossover distortion almost to inaudibility.

Now that we have identified the culprit as capacitor hysteresis, can we reduce or eliminate this hysteresis distortion in audio circuits?

Capacitor forming

An electrolytic capacitor performs at maximum efficiency when it is fully formed, or holding the maximum charge of which it is capable. A 100 V electrolytic cap in a power supply running at 15 V never becomes fully formed and operates at sub-par efficiency. In effect, there is less filter capacitance than if the capacitor was fully formed. The hysteresis distortion is related to how deeply the capacitor is formed. The more fully formed, the worse the hysteresis.

This explains why lower voltage value electrolytics always sounded worse in our listening tests. Of course the policy of using 300 V rated electrolytics as

audio coupling caps does not make any sense at all. The audio quality improves, but the size and cost become major problems. We might just as well use a large film capacitor.

So why don't film capacitors exhibit the same hysteresis electrolytics do? Actually, there is a hysteresis in these film caps. But because they are non-polarized, the charge is symmetrical. It is not changing with each audio cycle alternation. This substantially cancels the hysteresis distortion when using film or other non-polarized caps. Remember that the electrolytic cap cannot hold a charge when reverse-biased. It is acting more like a short circuit. The best cap is still no cap.

Conclusions

What can you do to improve the performance of audio devices using electrolytic capacitors? A lot:

1) Bridge all power supply filters with large film capacitors, the larger the better. Be sure not to exceed the voltage rating of the film caps.

2) Remove audio coupling electrolytics wherever possible. Many are not needed. Determine this by experimentation. Every electrolytic out of the signal path will improve performance. The determining factor will be the DC offsets present in the circuit without coupling caps.

3) Remove electrolytics used as input and output capacitors wherever possible. Many of these also are unnecessary. Determine by experimentation. Measure the DC output voltage after removing interstage and input/output caps. If the DC offset is under 250mV or so, you will not experience any problems without the caps. But remember that DC offset is cumulative until the next coupling capacitor.

4) Where capacitors absolutely are necessary, consider replacing them with high-quality film caps. This becomes a size and cost problem in some circuits. Metalized film caps are somewhat smaller and cheaper than pure film types. Experiment for best sound quality. Some



brands sound better than others.

If you can totally eliminate one half of the electrolytics in any device, replace a few with film capacitors and bridge the power supply filters, you will reduce hysteresis substantially and improve the definition in the audio device.

Experimentation invites disaster. Do so carefully, using devices that you can afford to lose.

Burn-in signals

To some engineers, burn-in compact discs are nothing more than snake-oil in a jewel case. I have found that burn-in discs can improve the sound of an audio component, especially where low-value electrolytics are used in abundance. Is it possible that the burn-in signal affects the electrolytics in such a way as to reduce hysteresis and thereby make them more musical? To accomplish this, the burn-in signal would have to decrease the efficiency of the 'lytics by stressing them.

The jury may still be out on burn-in discs, but let's not discount them without further study. This is a field in which I am still performing research. If you have done any research into the sound of capacitors and want to share it, contact me by e-mail with your conclusions. We still have much to learn about the sound of capacitors in audio circuits.

■ ■ ■

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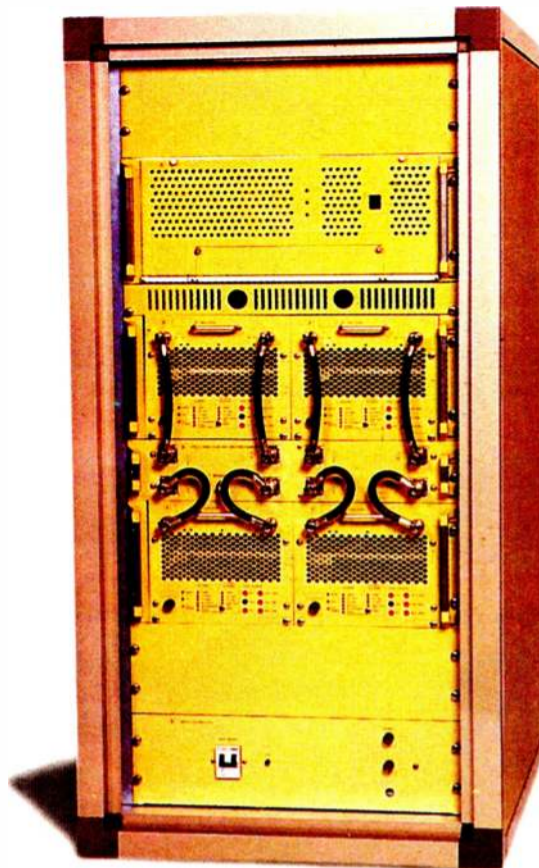
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World Radio History

Farm Field Is Fertile Ground for Radio

Dee McVicker

"I didn't want to get up at five in the morning to milk cows the rest of my life, so now I get up at a quarter to three to do a program for people who get up at five to milk cows," quipped renowned farm broadcaster Orion Samuelson.

It's been a running joke for years, almost since Samuelson started his broadcast career in 1952 spinning records at a small station in the Midwest. He is vice-president of agriculture services at WGN's Farm Department, the biggest agriculture-related broadcasting entity in the nation, and recently completed a run as the president of the National Association of Farm Broadcasters.

WGN(AM), Chicago's 50,000 W clear channel station, uplinks 14 agricultural broadcasts by Samuelson and associate Max Armstrong to 95 Tribune Radio Network affiliates in various Midwestern markets each day. Samuelson's "National Farm Report" is carried by 350 radio stations; his "U.S. Farm Report" is carried by 190 television outlets.

WGN's Farm Department broadcasts agribusiness reports beginning at 4:50 a.m. and continuing through the day until late evening, Monday through Saturday, for a total of 28 broadcasts daily.

Samuelson is the only broadcaster in the nation to receive two "Oscars in Agriculture," an award program administered by the University of Illinois; one award was for television, one for radio. In 1984, he served as master of ceremonies for President Ronald Reagan's "Hometown Birthday Party" in Dixon, Ill.

Next month, Samuelson joins two colleagues in a new broadcast venture, Channel Earth Communications, which will uplink 13 hours of national farm programming weekdays through DIRECTV. Samuelson will continue his duties at WGN under a contractor arrangement.

Buying the farm market

It's not hard to imagine why Samuelson and WGN are in the agricultural and agribusiness market; WGN's advertising take for this market was around \$4 million in 1995, according to Samuelson. He said WGN reaches more than 93 percent of the national agriculture community in the United States.

Aren't these figures stratospheric for an audience whose main topic of interest is the weather? "The two basic things farmers want instantly are, of course, market and weather," replied Samuelson, who reports on grain, livestock and other market prices from the Chicago Mercantile Exchange. Weather is reported live throughout the day by WGN's resident meteorologist.

But weather and market are just parts of the agriculture and agribusiness story, he said. In 1996, WGN reported on record high prices for wheat and corn; very strong markets for soybeans; the new farm bill that will dramatically change the direction of U.S. farm policy; and a record \$60 billion agricultural export, which, according to Samuelson, "gives agriculture a strong positive trade balance in our overall balance of trade."

Scattered among the county fairs, 4-H conventions, and dairy shows that WGN covers are news reports on foreign exchange and the politics of farming. Once or twice a year, Samuelson makes a trip overseas, as does his partner and on-air sidekick, Max Armstrong, to report on what he calls the globalization of agriculture.

"I've been covering farming for 44 years now, so the young reporters are beginning to say, 'What's the biggest change you've seen in all your years of

covering agriculture?'" His one-word answer: globalization.

A jaunt last year to India and the former Soviet Union with U.S. Secretary of Agriculture Dan Glickman cemented his conviction that export is the arena in which the U.S. agricultural market opportunities are. The trip "left me with a lot of deep impressions. It just made me very bullish (on) American agriculture," he said.

Samuelson hasn't always been so pro-foreign market. "I grew up on a Wisconsin dairy farm, and when that can of milk crossed the fence line, we forgot about it," he said. "But today, you find farmers who produce corn, soybeans, milk, meat, whatever, generally

See FARM, page 27 ▶



Orion Samuelson didn't want to milk cows.

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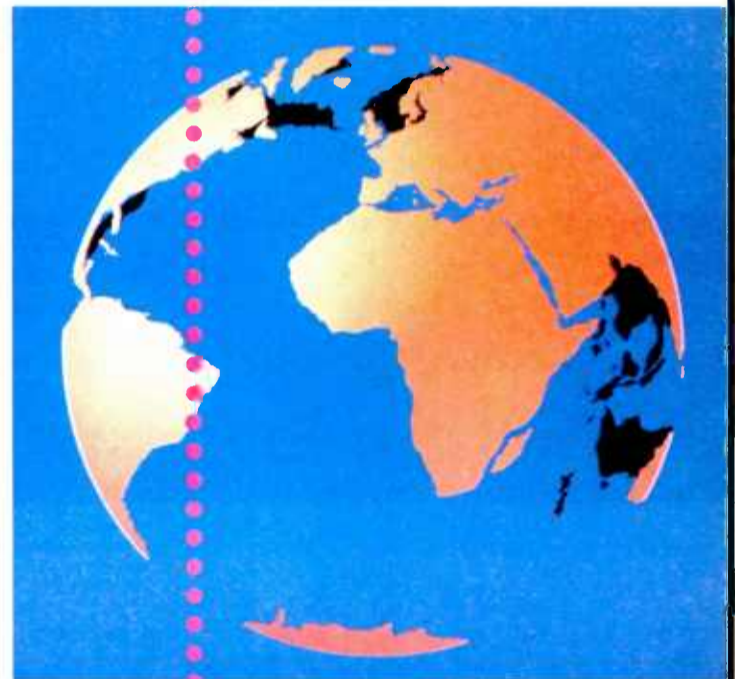


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KTRH Receives Award



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Pictured l-r: Frank L. Culbertson, Jr. Astronaut, Manager Phase 1 Program, Joe Izbrand, KTRH News Director, Amy Cooper, KTRH Public Service Coordinator, George W.S. Abbey, Director, NASA Johnson Space Center, Bill Readdy, Commander, STS-79, Shannon Lucid STS-76, STS-79, Mir 21 Crew Specialist, Jay Apt STS-79 Mission Specialist, Tom Akers, STS-79 Mission Specialist, Newly appointed Acting Deputy Director, NASA Johnson Space Center and Carl Walz, STS-79 Mission Specialist

Samuelson Plows New Media Fields

► FARM, continued from page 25 contributing ... to help find new uses domestically and to promote sales overseas."

So sophisticated are farmers today that at least one-third of the largest are linked to the Internet and many more have cell phones. It's not uncommon for a farmer to call WGN with progress reports literally from in the fields.

Planting for the future

Samuelson has also seen another trend in the fields of the nation's wheat belt: The primary audience of farm broadcasting is becoming smaller and more diverse.

Fewer than 2 million people now live on farms, and Samuelson feels that they have never been more divided between traditionalists and technologically advanced farmers. Part of the solution, Samuelson believes, is programming that speaks for farmers, instead of to them.

More than 100,000 Chicagoans keep their dials trained on WGN during his noon report.

This, he said, is proof of the public's interest in farm broadcasting.

He believes radio can be an outreach for farmers, but also feels strongly that neither radio nor television has a corner on the market. At age 62, he's planting the seeds for sweeping technological change.

As chairman of Channel Earth Communications Inc., he will turn new ground in direct-to-home satellite small dish broadcasting and, eventually, interactive Internet.

"This new company will have technology we never dreamed about. ... It brings cable to every farm and ranch in America," said Samuelson.

Samuelson will continue his duties at WGN, and plans to stay rooted firmly in the medium that brought from out of the fields a Midwestern youth who didn't want to get up at five in the morning to milk cows.

...

Dee McVicker, a regular contributor to RW, is no stranger to farm broadcasting. She grew up listening to the hog and grain reports on AM radio in her hometown of Farmington, Minn. Reach her at (602) 545-7363 or roots@primenet.com

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A Computer Network Case Study

Lynn Meadows

It was a project that started innocently enough.

Engineering consultant Jeff Loughridge, president of Audio Concepts & Engineering Inc., and Ben Miles, general manager of WCDX(FM), decided that instead of buying more printers, they would install a computer network to enable the five or six existing workstations to share the printers the station already owned.

Nearly three years and 20 workstations later, Loughridge has had plenty of time to reflect on the decisions made in installing and maintaining the radio station's computer network.

"We started out with a noble purpose," said Loughridge of the intent to share printers. Today, he said, printer prices have dropped until they are almost not an issue. Sinclair Communications, which owns WCDX, has since added both Magic 99 WPLZ-FM and Smooth Jazz WSMJ(FM), and made Loughridge the permanent, full-time chief engineer for all three stations.

Getting started

When Loughridge first thought about a network, only the three computers in the WCDX traffic department were tied together, using Lantastic. Loughridge decided to try Windows for Workgroups and set up a mini-network to test it out on two computers at his home.

He knew he did not want to install a Novell network.

"Novell is like something that was written by a lawyer," he said, noting the overhead involved. He called the Windows network a "no brainer" to set up at home, and approached the general manager about using it at the office.

Not using Novell has caused a little frustration, but not because the Windows platform is not robust. With each new software purchase, said Loughridge, the software distributors will say the same thing: "We do not support the Windows network platform."

When the station bought the DOS-based Marketron package for traffic, for instance, Loughridge was told it would not work on a Windows network. After making some adjustments, Marketron sent Loughridge an upgrade and established the Sinclair stations as its beta site for using their product with Windows 95.

The only software product to date that will not work on the Windows network, said Loughridge, is the Arbitron Maximizer 96. He must install it directly onto each individual workstation.

Loughridge said he would probably not be as ambitious with the network if he could do it over. Windows for Workgroups networks are typically peer-to-peer designs in which workstations share information between themselves without a centralized hub. In the Sinclair network, however, Loughridge used a client-server type of installation and made one computer dedicated much the same way Novell uses a dedicated server.

He installed programs like Word Perfect Office on the one dedicated machine, thinking it would be easier to upgrade with new versions on one computer than on 25. But sharing executable files has caused some problems, so he is now in the process of installing the

programs on the individual workstations.

The dedicated computer will still hold all data files and password-protected user directories, said Loughridge. Realistically, he said, program upgrades come just once a year and many people keep the older versions anyway if they do everything they need.

Cable comments

Loughridge would change a few things if he were to reinstall the network. He would use twisted-pair cable, which he said is more reliable than the coaxial cable he started with. Coax, he said, operates like a big loop. Disconnecting any portion of the loop will bring the network down. Twisted-pair cable would be used like spokes from a hub.

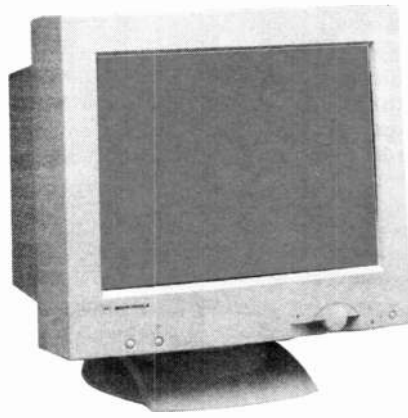
Loughridge discovered that many employees did not realize how Windows works.

Early on, Loughridge received the call that sends fear into the hearts of the bravest network administrator: "The network is down. Nobody can do anything." Someone who needed to use their computer for a seminar in the conference room had moved it, leaving the coax disconnected on the floor next to their desk.

Because coax has a 605-foot limit, Loughridge installed repeaters to get it around the building. He used up much of the footage in snaking cable up and down walls. However, each twisted pair can travel 300 feet per run from the hub. Accordingly, Loughridge is using twisted pair for the jazz station built last June.

An upgrade to Windows 95 went "absolutely perfectly," said Loughridge, who used his home machines as guinea pigs before installing it, one computer at a time, at the station.

Employee education helped eliminate another recurring problem: complaints of lost data. After looking over some shoul-



ders, Loughridge discovered that many employees did not realize how Windows works. As he watched, a user who thought the computer had locked up would automatically reach for the power button to rest the machine — a surefire way to lose data.

He showed them how Windows 95 lets a user abort a frozen operation without having to reboot.

The final step

Prior to the debut of Smooth Jazz, the Windows for Workgroups network handled only the administrative side of the station. In June, however, managers bought a digital audio system from Scott Studios. The system automates the station in the evenings and on weekends.

Scott told Loughridge the same thing other suppliers did: "We don't support this under a Windows network." In fact, none of the problems encountered with the new system, said Loughridge, were network-related.

But given the importance of staying on the air, he is in the process of switching the Scott system over to a Lantastic 7.0 network. Dave Scott, president of Scott Studios, said the digital audio system will work under Windows for Workgroups, but added, "It's just not our standard." The company tells its clients that using either Windows NT, Novell or Lantastic is a better option for integrating the Scott system with a network.

In an average week, Loughridge said he probably puts in about 15 hours per week just maintaining the network. He

Radio Fame, Fortune

► MOGUL, continued from page 21

it would help him secure a temporary reprieve from his upcoming stint in the Israeli army.

That last point aside, his offer was tempting, and definitely within financial reach. I ran it by a few friends in the business, including some who are familiar with the "Holy Land" radio market. In an e-mail titled "Oy Vey, Stay Away," Howard Price of WABC-TV in New York expressed his doubts.

"I'm wary of anyone who tells me his transmitters will be located outside of Israel's borders," he wrote. "Where? The West Bank that will be under the unreliable control of a still-developing Palestinian administration? The Mediterranean? That presents some daunting maintenance and engineering problems."

Yes, Howard admitted, it sounded

tempting, but in conclusion he wrote, "To quote the robot on Lost in Space: 'Danger, Will Robinson.'"

Years from now, you may see another RW article under my byline titled "How I Almost Made a Fortune Investing in Israeli Radio." I told Shmuel I was taking a pass, but that I would forward his information to some big-time acquaintances already playing in the international arena (and I did). In the meantime, best of luck, Shmuel. I hope you make millions, even if I have to spend the rest of my life kicking myself.

Lee Harris is morning anchor at all-news WINS(AM) and a former station owner. He is also president of Harris Media, a website design and hosting firm. Contact him via e-mail at lee@harrisnet.com

said he is always upgrading motherboards and no one in the station has anything slower than a 486-66 MHz machine.

The station did consider outsourcing the network maintenance, but the quotes were between \$75 and \$125 per hour.

"With 10 hours of work each week, you are talking \$50,000 a year," said Loughridge.

Engineers should take note, Loughridge called computer knowledge an "opportunity for engineers to raise the value of their stock" within the company. He said the more an engineer can save the company by not outsourcing, the more valuable he or she is.

Loughridge strongly recommended that network administrators find a local computer store and establish a relationship with it.

He said he does not have a single brand-name computer in the building, so he need not worry about anything proprietary.

If a power supply fails, he said, he has another on the shelf and simply replaces it. He also visits computer shows, where prices can be reduced as much as \$100. Now, the store he frequents gives him computer-show prices during regular business hours.

In his limited spare time, Loughridge said he is working on developing different software programs for stations in Visual Basic 4.0. One is an inventory database for radio stations.

Another is a trouble-shooting database for engineers. He also wrote a Windows-based application for analyzing Arbitron results. He plans to sell them in the future. The other computer-related project, of course, is bringing the Sinclair Richmond stations onto the Internet.

"Some of the people on staff are as enthusiastic as I am," he said. The concern from management is how much time it will take to update the site. Loughridge has been working on a home page for the Smooth Jazz station at his home.

Lynn Meadows is a freelance writer based in Virginia Beach, Va.

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MARKETPLACE

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The Stanton 1001 Pro stereo headphones feature dynamic frequency control, dual earcup controls for adjusting seven listening parameters, large vinyl-covered ear and headband cushions and a 12-foot coiled cable.



Heavy-duty driver elements along with dynamic frequency control provide flat frequency response to a bass boost of 6 dB. Specs: 20 Hz to 20 kHz frequency response, 100 ohms impedance, two-inch diameter heavy-duty transducers and more.

For more information from Stanton, contact the company in New York at (516) 349-0235; fax: (516) 349-0230; or circle Reader Service 37.

TS-1D Transient Suppressor

Radio Design Labs' TS-1D is a passive transient voltage suppression module capable of providing immunity from electrostatic discharge, induced transient voltage, RF interference and electromagnetic pulse.

The TS-1D shunts high-energy, high-frequency signals to system ground while passing unaffected, full-spectrum

audio signals. Containing four independent circuits, it can protect four single-ended unbalanced, or two balanced, lines.

For more information from Radio Design Labs, contact the company in California at (800) 281-2683; fax: (800) 289-7338; or circle Reader Service 36.

Crown K2 Amplifier

Crown introduced the K2 amplifier, the first amplifier to utilize the company's proprietary patent-pending Balanced Current Amplifier (BCA) circuitry to generate high power while generating little heat.



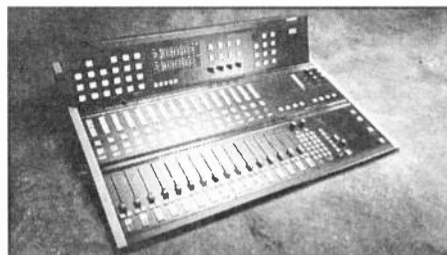
Two rack spaces high, the K2 can deliver 2,500 W (1,250 W per channel into 2 ohms) at more than double the energy efficiency of conventional switching amps.

This allows for plugging more amplifiers into a single AC circuit while decreasing overall operating costs.

For more information from Crown, contact the company in Indiana at (847) 998-0600; fax: (847) 998-0260; or circle Reader Service 38.

RCS Digital Audio Console

The new RCS digital audio console has a self-monitoring program and a modular design that is hot-swappable. It is easy to use, with function buttons that allow each user to save set-ups and configurations — or program one-button "macros" for fast recall.



The console includes a 30-bit bus structure, 24-bit AES data, and 18-bit or 20-bit analog audio. DSPs for EQ, compression, limiting, gate and delay are available on board. The built-in router allows the console to be configured for up to 1,024 sources and 1,024 outputs.

For more information from RCS, contact the company in Texas at (512) 418-5281; fax: (512) 418-5281; or circle Reader Service 78.

Porta-Strip Power Stripping Tool

The RFA-4015 porta-strip from RF Connectors can be used with all sizes of coaxial cable. It's a low-cost, effective



alternative to bench strippers. Small, lightweight, fast and easy to use, it offers quick changes with interchangeable cutter heads to fit all types of ABS carrying cases and AC/DC battery charges.

For more information from RF Connectors, contact the company in California at (619) 549-6340; fax: (619) 549-6345; or circle Reader Service 77.

Factory Direct Sales

Representing DB Elettronica of Italy, distributor Factory Direct Sales supplies a full line of FM transmitter and translators in North America.

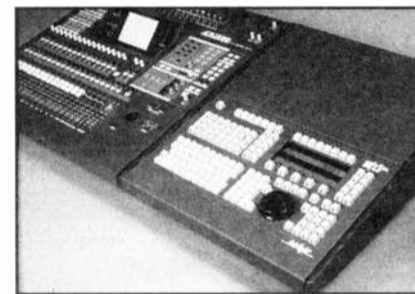
Products include 120 W and 300 W solid-state FM transmitters and translators that use satellites for program feeds. All have an optional stereo generator, compressor/limiter, remote interface and FSK ID for automatic station identification.

Higher-powered FM transmitters include 1 kW, 2.5 kW, 5 kW, 10 kW, 15 kW and 20 kW. All use solid-state digital exciters and solid-state IPA drivers.

For more information from Factory Direct Sales, contact the company in Texas at (972) 473-2576; fax: (972) 473-2578; or circle Reader Service 53.

Fairlight MFX3plus

The Fairlight ESP MFX3plus Digital Workstation runs up to 40 times faster and features a new CPU, PCI bus support, enhanced graphics and a controller that is one-third smaller than the original MFX controller. The MFX3 plus can



be configured to meet a broad range of budget requirements. The individual function-specific software modules allow users to purchase what they need when they need it. With the proprietary-based CPU featuring a PCI interface, the user can buy off-the-shelf technologies as they become available. The controller is also available in four versions for a stand-alone desktop operator, 19-inch rack mount, FAME operation and a configuration for integration with the Yamaha 02R digital mixer.

For more information from Fairlight USA, contact the company in California at (310) 287-1400; fax: (310) 287-0200; or circle Reader Service 76.

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Focusrite Is Clean and Green

Ty Ford

Just when you thought there was no more room in the single-rack space mic pre/compressor/expander/de-esser/EQ segment of the market for a new entry, Focusrite pops its Green Range Voicebox at the premium price of \$1,349.

That is a bit high for the analog genre, which normally spreads from about \$600 to \$850. The Voicebox shares a similar look with Focusrite's Dual Mic-pre and Focus EQ, but has slightly different applications and specs. According to the literature, both the Dual Green and the Voicebox have the same mic preamp section. A peek under the hood leads me to believe that the mic preamp chip is the Philips NE5532D.

The box itself is shallow, extending just 5 inches behind the rack ears. The back panel is laid out simply, with balanced XLRs for mic in and line out, TRS jacks for link (stereo control for two units) and a mute connector for a remote cough switch.

There is also an 85/120V, 200/240V power supply switch, standard IEC main power socket and phone and fax numbers for Focusrite in England. The back panel and cast aluminum alloy case run hot to the touch because they double as a heat sink and there are no holes in the case for ventilation.

I have no qualitative comments about the design of the front panel. It will get most people's attention, which is what it was designed to do. The front panel controls start on the left with a +10 to +60 dB gain knob, and switches for +48 V phantom power, phase reversal, 12 dB/octave 75 Hz bass roll-off and mute.

Over the threshold

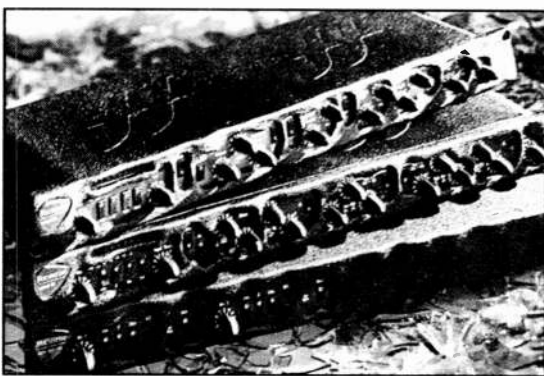
The threshold control (and only control) for the expander is in the same cluster. A 10-segment LED meter displays input level. There's also an "Ext. M" LED that indicates external muting from the jack on the back panel.

The compressor is next, with I/O switch (the expander does not have one) and continuous controls for threshold, ratio (1.1 to infinity) and makeup gain up to 20 dB.

There is also a "comp to meter" switch that converts the input level LED meter to read gain reduction and an Auto Release control that slows the release time for signals the further they exceed the threshold. Quick trips and small amounts above the threshold result in faster release times. According to the documentation, attack time is 33 microseconds, release is 33 milliseconds. In close-working the mic, Auto Release reduced the volume of the voice a little.

The de-esser follows with its own I/O switch and continuous threshold and bandwidth controls, from one to four

octaves. The Voicebox does a fairly good job without a frequency selector to dial in the precise sibilant frequency, but a



Focusrite Voicebox (on top)

deft hand is needed on the controls. If the threshold is set too low, you can hear what sounds like the compression pulling down the overall level of the track.

The three-section EQ has its own I/O button. The Low-frequency section is a simple ± 18 dB shelf that sweeps from 100 Hz to 1 kHz.

The Mid-frequency is a quasi-parametric with ± 18 dB from 600 Hz to 6 kHz with a notch switch to narrow the Q of the circuit. The High-frequency is narrow, offering a ± 18 dB shelf from 1 to 10 kHz. Finally, there is a master gain control and a clip LED that fires at +20 dBu, or 6 dB below clipping.

To get a sense of what the mic preamp was all about, I used a Gefell UM70 condenser mic on a male voice for the first test. Comparisons were made with Mackie 1604 and George Massenberg Labs (GML) preamps, the outputs of which were fed through the 1604 and into a Panasonic SV-3900 DAT machine recording at 48 kHz.

The Mackie preamps were brighter and edgier than either the Focusrite Voicebox or the GML. The latter two were noticeably smoother on the top end without being dull. The Focusrite was a bit more edgy than the GML on the lower frequencies, around 70-150 Hz.

The Voicebox preamp gain stage just passed my RCA 44B test, and sounded quite good with the Soundelux U95 tube mic, the Oktava MK-219 and Sennheiser 421. As with most compressors, more compression increases the brightness and rolls off some of the bottom. And, the more compression you use, the louder the inhalations between words.

To get away from that, you need a good gated compressor.

On the air

Working a mic in a broadcast environment often means having less than a quiet environment. That's what makes the expander such a great tool. The expander on the Voicebox required a bit of tweaking.

The noise from my nearby laptop hard drive presented an interesting challenge, even though it was positioned about 2 feet

off the back of a cardioid mic. If I raised the threshold too high, the expander snapped shut unnaturally. To get a nice, tight signal with minimum noise trails, I backed off of the input gain, set the expander threshold more moderately and made up the lack of signal with the Voicebox's master output control. Using compression and the expander together created more problems.

Even with 2:1 or 3:1 compression ratios and only 2 to 4 dB gain reduction, the expander just could not get the laptop hard drive noise out gracefully.

Lesson learned: You can depend on expansion only so much. After that you really need a circuit with an integrated expander/compressor to address the noise source itself.

Even though the order of the processing sections can't be moved around, I think broadcasters will gravitate to the Voicebox.

They do have to get past the cost, but the compressor does a good job of "chunking up" the human voice.

The remote cough switch feature will make engineers feel comfortable.

They can mount the chassis where curious fingers can't get their hands on it and still use the mute as a cough switch or fader start. The Voicebox is also easy to operate.

Although the price of the unit puts it at a disadvantage on the competitive cost/benefit curve of similar devices, the Focusrite Green Range Voicebox is definitely worth a listen.

■ ■ ■

Ty Ford's "Advanced Audio Production Techniques" is available from Focal Press. Call (800) 366-2665. Download his voice demos from ftp.jagunet.com/pub/users/tford

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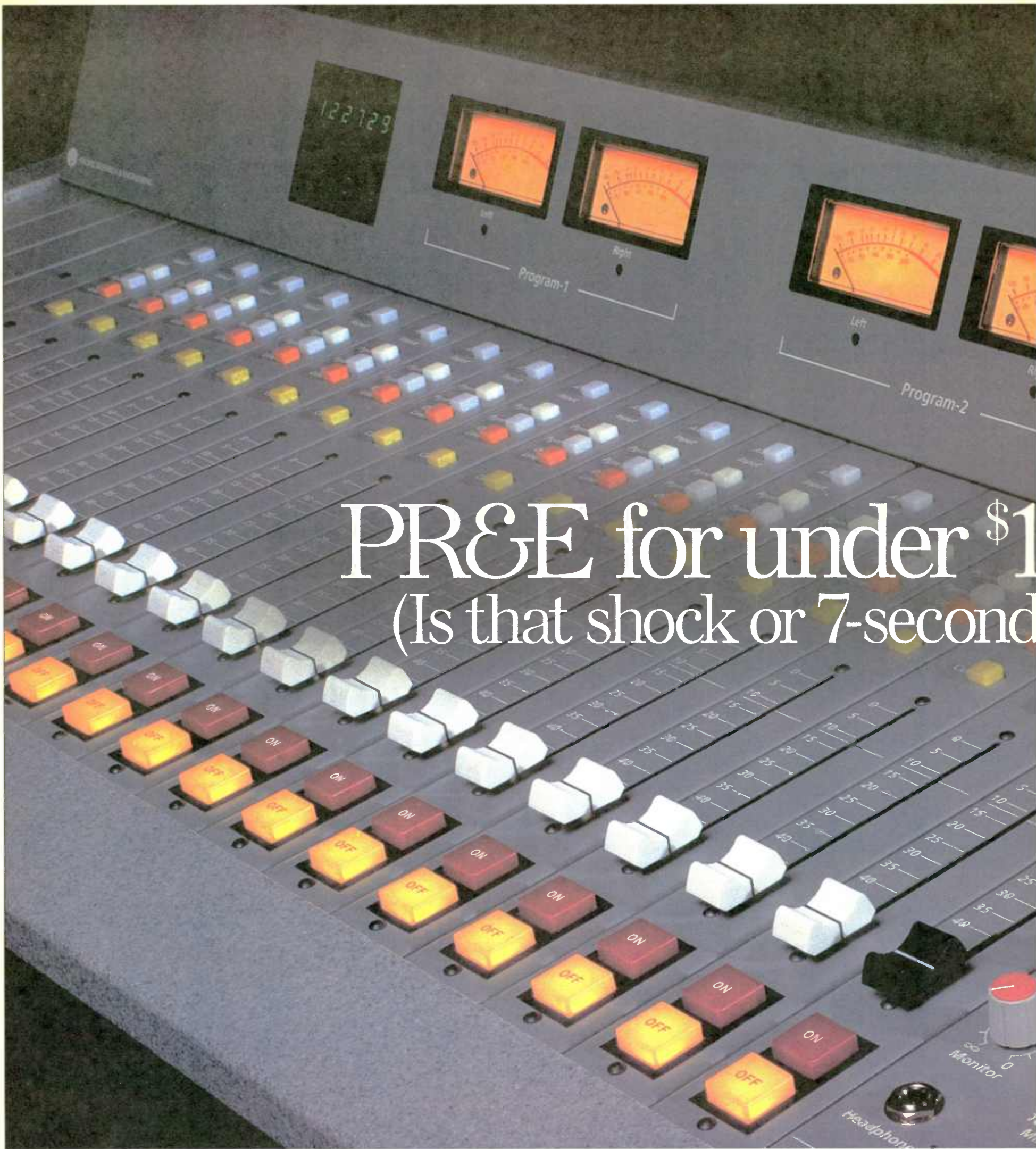
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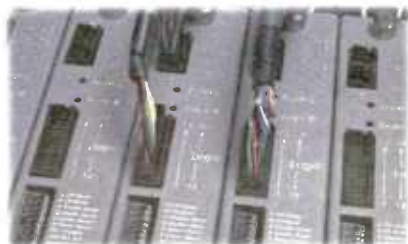


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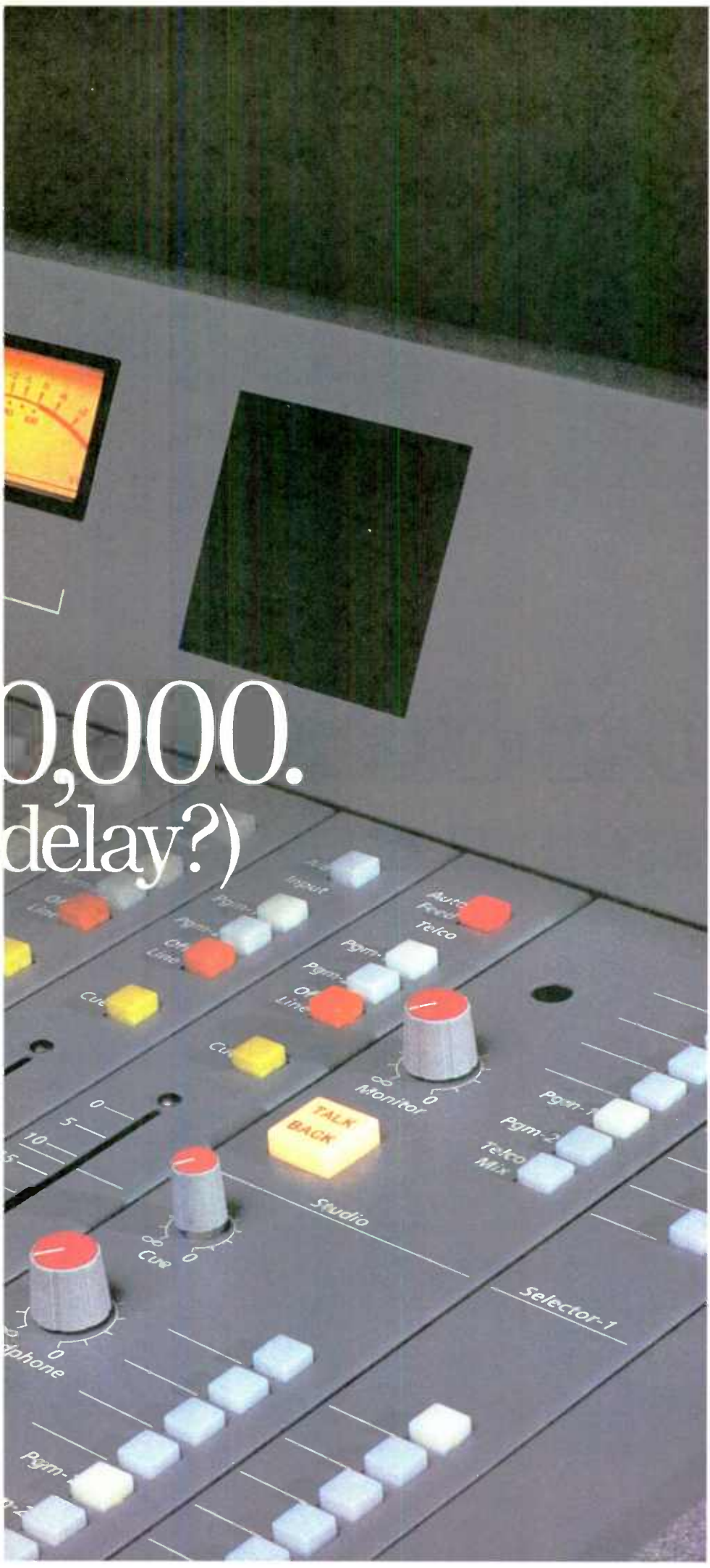


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SHORT TAKE

Furman Cures 'Warts'

Al Peterson

From the "What a neat idea" department comes a novel device from Furman Sound: the five-outlet PlugLock.

A quick peek behind your equipment rack reveals why a PlugLock or two would fit right in at your station.

More and more audio devices are being run from external power supplies, or wall warts, which eat up space and block other outlets on a strip.

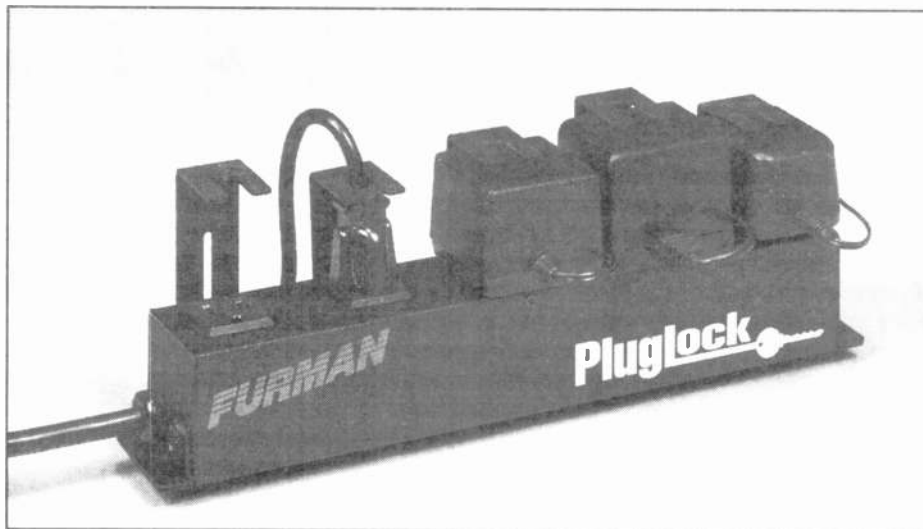
The Furman PlugLock accommodates five wall warts (and conventional plug, too) with plenty of space between AC outlets. Each outlet is positioned so power blobs do not cover adjacent recepta-

cles. The locking clamps secure each power supply in place with no danger of rocking loose and falling out.

Clamps secure each power supply

The PlugLock is rated at 15A with a circuit breaker and heavy duty, 5-foot, 14 AWG three conductor cord. If your studio must endure one wall wart after another, it might be time to consider a PlugLock from Furman Sound.

For information, contact Furman Sound at (707) 763-1010 or circle Reader Service 54.



New Furman PlugLock tames the savage wall wart.

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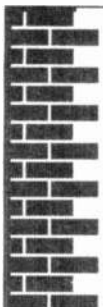
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Nagra Goes Digital With ARES-C

Rich Rarey

Two friends, professionals in the film and record business, recently stopped by to visit. Each spied a box on the desk that had the characteristic Nagra look: sturdy machined aluminum body, solid controls, circular meter.

Their eyes widened when they looked through the clear acrylic lid and saw what replaced the ubiquitous reel transport: two 10MB "flash" memory cards, an edit jogwheel, function keys and an LCD display. The whole package weighed about 7 pounds.

Their mouths watered slightly when they found the Nagra ARES-C was a field-ready digital audio recorder, with a built in EDL (Edit Decision List)-based editor and the option to transmit the audio via ISDN or conventional telephone.

The ARES-C would be the perfect device for anyone working away from "headquarters," in environments where conventional analog recording and editing are impractical because of the burden of hauling reel-to-reel tape, and conventional electronic editing is impractical because of the lack of AC power.

Mastering tool

Even if one uses a DAT to record material in the field, the ARES-C comes in handy as a mastering recorder.

The material is transferred into the ARES-C, cut together, and can be transferred back to a DAT through the AES/EBU output or to an analog destination through the line outputs, or transmitted directly by analog telephone or ISDN.

Optional ISDN transmission capability (in firmware versions for the overseas market) makes filing from Europe a snap. Future firmware upgrades will allow ISDN connection in North America, with its peculiar SPIDs and other ISDN settings.



The Top-of-the-line Digital Nagra ARES-C

The ARES-C front end is Nagra quality: two good mic preamps with switchable phantom power and a stereo line-level input. Coarse mic gain is selectable between three ranges by front panel switches; a Flat/Speech/Low frequency attenuation switch selects between conventional Nagra-quality mic filters.

One-switch wonder

Recording functions are controlled by a six-position, recessed rotary switch. Stop, Edit and Play all work as labeled. Test engages the analog electronics for "record ready" status. Record and NO ALC/LIM both begin the digital recording "take." The latter position bypasses the programmable limiter.

The two removable PCMCIA "flash" cards can be swapped out easily on the fly. The ARES-C will support cards that conform to the flash type Series 2 or Series 2+, available in capacities up to 64 MB.

A J-Stereo, MPEG-I Layer II recording at 48 kHz sampling frequency will consume about 1MB of storage per minute of recorded audio, but will

deliver full-fidelity stereo. Using 64MB flash cards provides about two hours of recording. Selecting scratchier protocols, such as A-Law or u-Law, yields telephone-fidelity monaural audio but merely nibbles away at available storage. The ubiquitous G.722 protocol falls somewhere between.

Editing controls are logically arranged on the ARES-C top deck. Users can listen to the edits with headphones or the mutable built-in speaker, or by an external amp and speakers connected to the balanced line outputs.

Five "Chiclet" function keys below the 2.5 by 1.25-inch liquid crystal display control major editing decisions. The jog wheel and five cursor keys navigate within a take and between takes.

For our evaluation, I chose the MPEG protocol because it would reveal the highest-quality sound of which the system was capable.

Our ARES-C was equipped with two 10MB flash cards, giving us 20 minutes of stereo MPEG Layer II recording time. Each time the main function knob is turned to Record, the ARES-C begins recording the stream of digital audio as a new "take."

Recording a take is easy. Plug in a microphone or two, turn up the mic gain controls and turn the main function knob to the Record position.

We recorded the various sounds of a family at play: loud, young voices that loved the microphone, and found the digital clipping quite severe. The ALC/LIM setting with conservative levels is a smart move in unknown ambient situations.

Once we had material in the ARES-C flash cards, the fun of editing began.

Slicing and dicing

Selecting Edit on the main function knob activated the directory display. The directory lists the takes by number, date and data compression type. The user selects a card by pressing a function key, and then selects an audio take to edit.

Up to 420 takes are possible on one card. The ARES-C uses the thread-of-tape paradigm to display an editing workspace. Each "take" scrolls by as if a strip of magnetic tape.

The editing display shows the audio source on the top, a stream of audio or another Edit Decision List (EDL) and the Destination — your work-in-progress — on the bottom.

Completed work is assembled by selecting a start and end point from the

source by spinning the jog wheel, and pressing the In or Out key. The ARES-C then makes a pointer-based EDL in the Destination work area.

The great feature is the flexibility of the in and out points, and the seamless speed in which they are played. At any time, the edit points can be moved; either side of the splice can be enlarged or reduced and a section that had no splices can easily be split up into repeating pieces by the press of a key.

There is no need for an Undo key. The display shows the amount of movement of the splice as a \pm offset. The editing resolution is 24 milliseconds, and with the version 1.41 firmware, is slightly grainy for music editing. But with all edit points adjustable, only a little experimentation is needed to make good music splices.

The EDLs do not contain any data besides pointers to splices. Level, pan or any other modification to a section of the audio is not possible. On the other hand, the Nagra ARES-C was designed for reporters in the field, and rough interview material does not need other modification at this stage.

Cut and run

The ability to quickly pare down an interview several different ways will be a big plus to a freelance reporter. The function controls give 40X scan through the material, and the material can also be played by spinning the jog wheel. Completed EDLs can be copied easily to the other flash card, a task suitable for assembling edited material for transmission.

Analog telephone transmission is simple. Once the connection is made by another telephone, the phone line is connected directly into the banana jacks.

The neat part: The reporter can hear cues and conversation on the line in the headphones, and can speak down the line by turning up mic gain. When he or she is ready to feed the audio, one cut can be selected or an entire card can be played down the line.

The mic inputs are muted during the playback. Level control is adjusted by the Aux/Line out knob — remembering to change its functionality from input to output control from the main menu, of course.

The ARES-C's powerful features come at the price of short battery life. The manual indicates 2.5 hours for four D cells. This is typical, and Nagra offers eight-cell battery packs for 10 continuous hours of recording.

The ARES-C will accept any voltage between 6 and 12 VDC. This is an excellent feature if the only power around is a car battery.

Optional rechargeable packs, according to the manual, give 10 hours of life. As a safety feature, all work-in-progress is saved just prior to low-power shutdown. A user without fresh batteries can eke out a little more time by waiting a few minutes before powering up the ARES-C again.

Nagra has invested much creative thought and engineering on the ARES-C. It is a solidly built field recorder/editor for those willing to invest in their audio tools.

■ ■ ■

For information, contact Nagra USA at (615) 726-5191 or circle Reader Service 79.

Rich Rarey is the technical director for NPR's "Talk of the Nation." E-mail him at rrarey@npr.org

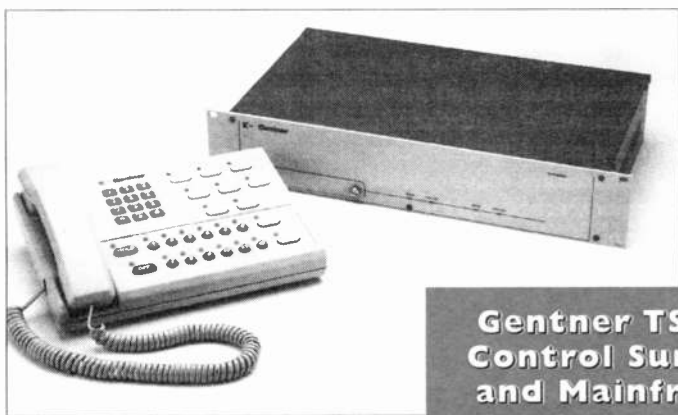


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DIGITAL DOMAIN

Canadian News Depends on Dalet

Mel Lambert

During an all-too-brief visit to Vancouver in early January, I had the opportunity for some fascinating first-hand experience with a powerful all-digital production and playback system that's now in routine use throughout Canadian Broadcasting's Radio Network.

Having taken the digital "plunge," CBC is now committed to the installation of almost 600 PC-based workstations from Dalet Digital Media Systems.

According to Remi Lafrance, senior project leader at CBC Montreal headquarters, these systems will be located at

some 46 sites across the length and breadth of Canada.

Novell

"The majority of our Dalet systems will be interconnected via Novell networks," said Lafrance, "allowing audio data stored on central servers to be accessed from a number of terminals throughout each site."

Plans are also in hand for setting up Wide Area Networks (WANs) to enable files and other materials to be shared among different Canadian production centers and studios.

Anyone following these columns in *RW* is aware of my views on system integration and the role that digital must play as we make the transition from familiar, tape-based editing to DAW-based manipulation.

Not only is the system extremely stable, but I heard nothing but positive reactions from the station staff that I met, on both the technical and editorial sides. The preparation, scheduling and on-air delivery software that comes with the Dalet system is simple yet elegant to use.

The Dalet Surfer editing software offers all of the power that a radio journalist would need to prepare the final materials.

And yes, the system sounds excellent. The utilization of an MPEG-2 data compression algorithm within the hard-disk-base is completely unobtrusive.

Lafrance tells me that extensive technical tests at CBC were performed on the 4:1 compression scheme before the corporation gave the final go-ahead. He offered that it was virtually impossible to hear any signal degradation even after eight or nine record/play cycles. Praise indeed.

According to Don Pennington, manager of resources (radio), and Peter Schell, manager of radio technical services at the CBC Vancouver location, 35 terminals are linked via a Novell LAN between a variety of newsrooms and playback areas serving both the English and French language news and current-affairs services.

Pennington explains, "The system is being used regularly for audio playback on our morning and afternoon news programs in both languages."

The Dalet "DeskTop Radio" system is configured around a Windows 95-compatible front end.

It has simple-to-follow icons to control the inputting of analog and digital materials into the system and editing into final segments using the built-in Surfer software.

Navigator software handles the sequencing of edited mono or stereo cues into appropriate play lists.

"Special in-house training was laid on

for the 120-plus news reporters, editors, producers and technicians that would be using the system," Pennington said.

In Vancouver, as in other locations, reporters get to load and audition news interviews and other feature material into the Dalet system from their workplace. Tielines to the central server handle audio transfers and relaying of analog audio into small monitor loudspeakers or, more usually, headphones.

By late December, more than 80



The Dalet Digital Media System

Compaq ProLiant and ProSignia servers running Insight Manager software had been installed throughout the CBC Radio Network. Each ProLiant server is equipped with 160MB RAM plus 10GB random-access storage available for multiple simultaneous playback.

While the Dalet Surfer editing software is reasonably basic in operation, it offers all of the power that a radio journalist or producer would need to prepare the final materials.

Stored audio files can be accessed from any terminal — certain material can be password-protected by the system — then dragged-and-dropped into a playlist under Navigator.

Events can be tagged as single-play, requiring the triggering from an external switch closure, or set up to follow in sequence, as in a stopset.

In addition to this live-assist mode, other software modules are available

from Dalet that provide satellite automation, walkaway music automation and other hybrid modes.

I watched the preparation of a noon news bulletin at the Vancouver News Room, a sequence that mimics closely the way it might be done in an analog-based facility. In this case, however, all sound cuts were replayed from hard disk.

Eventually, additional sound elements will be committed to replay from the Dalet system, including music and other longer-form materials.

Having prepared a news sequence on Dalet, the producer prints out a running order and hands it to the audio engineer. The Dalet system provides extensive note-taking facilities, with text files being associated with their corresponding audio cues. It can import text files from the existing CBC Prolog database files.

Controlling cuts

In the control room, an engineer can then access and pull up the relevant Cue List. The operator can review the playback sequence and check what audio materials are scheduled for the bulletin.

Then, when a hand cue is thrown by the newscaster, a press of a button on the dedicated control surface causes the cut to replay from hard disk.

The sequence is repeated automatically as the bulletin progresses. In the future, many of these operations might be handled by the on-air talent.

The Dalet Digital Media System approach seems to be finding favor at CBC, as it does in other installations around the world.

With ease-of-use and outstanding reliability being key design concepts within this leading-edge radio broadcast system, Dalet would appear to be just what the doctor ordered.

■ ■ ■

Mel Lambert is principal of Media&Marketing in Los Angeles and has been involved with the production and broadcast industries on both sides of the Atlantic for 20 years.

He can be reached via mediapr@earthlink.net or (818) 753-9510.

Self-powered Teleporter Needs No Batteries

Alan R. Peterson

POTS-type phone boxes are for more than news gathering and high school football games. When you have a once-only chance to get a live interview with the rock star who is in town for one show, POTS, or plain ol' telephone service, remains a dependable choice. It may sound telephonic, but it gets there fast.

When production is waiting for the sound bite of the artist's voice for the promo that has to air now, a unit like the Teleporter 2 from D&R Electronica b.v. (available through D&R USA) can get audio back to the studio right away. And it does so without having to provide a drop of power.

The self-powered Teleporter 2 has no batteries or plug-in power supply and does not need an adapter to fit the remote vehicle's lighter socket. It pulls

all the juice it needs right from the phone line, which is enough to run the mixer and power a set of headphones. Finally, a remote POTS mixer cuts the cord to the wall-wart power supply.

The Teleporter 2 was intended as a field news-gathering device, but it works fine in the sports broadcast booth as well. The Teleporter 2 is a good-sounding, easy-to-understand mixer/telephone box with features that play-by-play announcers and reporters will appreciate.

Power to the POTS

The idea of a self-powered telephone device is by no means novel. After all, with the exception of cellular and cordless units, telephones themselves are self-powered. Those that require batteries do so only to keep the autodialer memory alive.

See TELE, page 39 ▶

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Teleporter Mixer

► TELE, continued from page 38

However, the notion that you can run a remote mixer without having to scare up an AC source is an appealing one. Wall warts go "pop" when least convenient. AC cords are easily lost or forgotten, or get borrowed surreptitiously from the remote kit at the worst times.

Normal quiescent voltage on analog telephone lines is -48 VDC, although this value can swing appreciably. Still, this is ample voltage to power the Teleporter 2's DTMF dialing circuit and low-current chips, which were designed specifically for telecommunications applications.

Headphones can be hogs when it comes to power requirements, but newer, more efficient units have fairly reasonable appetites. A \$50 set of department store-grade Sony phones worked just fine with the Teleporter 2 that was loaned to RW.

Greenie check

I opened the box to examine the circuit board, half-expecting to find one of those huge 1-Farad memory capacitors inside. One would hold some reserve DC voltage and release it during peak audio demands (shouting into a mic, cranking the headset, et al.). Instead I found only straightforward, low-power components and a few high-quality Bourns isolation

transformers. The Teleporter 2 makes it all happen with clever, low-draw analog circuitry.

The transformers float the grounds of the plug-in gear so hum is stopped before it gets on the phone line.

A slide switch on the panel allows tone or pulse dialing from the Teleporter 2. It is hard to imagine pulse-only telco circuits anymore, but you would be surprised what you run into when you need a phone line badly enough. It is good to have both functions.

You may not have seen some of the buttons on the Teleporter 2. Four buttons labeled A to D send special DTMF tones downline for relay closures back at the studio, using the soon-to-be-released D&R TeleReceiver.

The two units working together would allow a field reporter to remotely start record functions back at the studio. Four other keys marked P, F, R and > are for programming and redialing phone numbers.

A nice chunky limiter inside the Teleporter 2 keeps line send levels tame.

During my tests, I turned the mic input



The Teleporter 2
From D&R Electronics

up to full and worked the mic very closely. My headphone signal sounded hot and a little clippy but a recording made at the other end of the line sounded clean and loud. The thing works.

The Teleporter 2 has inputs for only one mic and a line-level device. If you wanted to use the unit for a two-person broadcast (two mics), you may wish to look at other devices. Certainly an external mixer with additional mic inputs can be connected to the Teleporter 2, but that requires power and defeats the intent of going out into the field sans batteries.

Still, if you are venturing out with a recording device as well, batteries will make the trip with you anyway. It's your call.

Those "rack ears" on the front are deceptive.

In the photo they look as if that is how the unit is grabbed and handled. In real life, the box is much smaller and those ears are more like shoulder strap brackets.

Final comment: Do not use the Teleporter 2 with a cellular phone.

The unit's circuitry requires operating voltage from a public/domestic hard-wired phone connection.

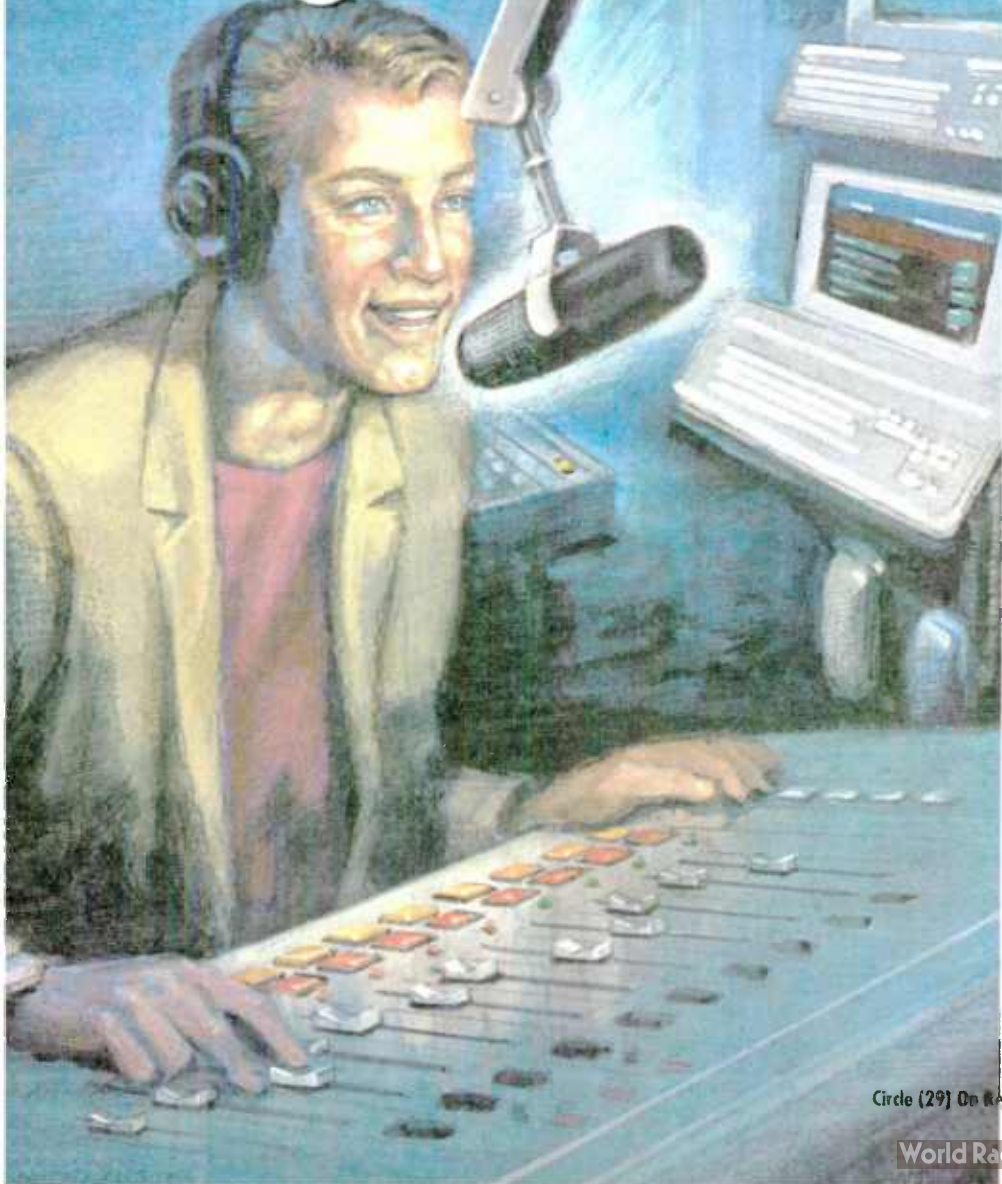
You will not get that kind of sustained power anytime soon from a cellular battery.

Someday, all telephone lines everywhere will be fast enough to handle digital POTS codecs without difficulty. Someday also, cellular service will be available in the remotest corners imaginable.

But until then, if your project can tolerate the limited bandwidth of telephonic audio, a unit like the D&R Teleporter 2 can mix and send satisfactory audio to the station. Doing it without batteries is a pretty cool trick.

For information on the Teleporter 2 and the Telereceiver, contact the U.S. office of D&R Electronics at (903) 485-2344 or circle Reader Service 55.

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Philips Electronics has introduced an advanced version of the Professional Sound Enhancer.

The IS 5022/F3D is a refinement of the existing IS 5022 Enhancer, with the addition of two Philips stereo DAC7 devices and the new 5B digital filter with fourth-order noise shaper. The latter feature improves S/N performance by 5 dB. The new Enhancer has 20-bit A/D and D/A converters.

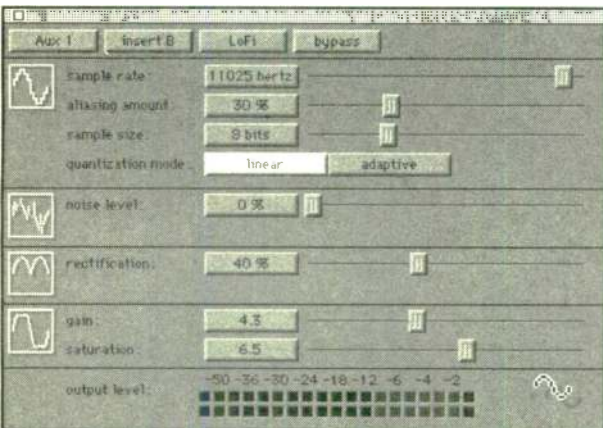
The rackmount unit has analog and S/PDIF ports. It carries a suggested price of \$3,450.

For information, contact Mackenzie Laboratories at (909) 394-9007, or circle Reader Service 62.

Digidesign Plug-ins

New plug-in modules are available for the Digidesign Pro Tools system.

LoFi and SciFi plug-ins perform "down-processing" to diminish audio



quality for specific creative purposes. LoFi includes bit-rate reduction, sample rate reduction, variable amplitude noise generation, a software full-wave rectifier and subharmonic synthesis.

SciFi includes a ring modulator, positive and negative resonator, FM, modulation control by LFO and a sample-and-hold feature.

Third-party software provider Synchro Arts Limited has made ToolBelt available to Pro Tools users. This plug-in includes a time compander, looping processor, reverse and invert functions and a chaos theory-based audio generator.

For information, contact Digidesign at (415) 842-7900, or circle Reader Service 73.

Microboards CD Duplicator

Microboards Technology Inc. (MBI) of America offers a second-generation, high-performance CD duplicator known as the CD Blaster II.

This successor to the original CD Blaster I has several new features, including streamlined system data throughput, improved integrity of CD recording, expandability and connectivity. The CD Blaster II can duplicate in either Track-at-Once or Disc-at-Once modes; the latter produces the equivalent of glass master-ready CD-Rs.

CD Blaster II complies with the Red, Yellow, Green, Blue and White Book specifications and can drive up to four 4X CD recorders simultaneously. The

single 4X drive version is priced at \$2,995 and the four-drive version with SCSI MUX is \$7,995. An optional 1 GB SCSI hard drive is also available.

For information, contact MBI of America at (612) 470-1848 or circle Reader Service 63.

Yamaha MIDI Sampler

Yamaha is back in the sampler game with the new A3000 Digital Sampler. This is a \$1,700 feature-packed unit for techno-beat crunchers and radio production pros alike.

The A3000 has 64-note polyphony (the ability to play 64 notes simultaneously) and is expandable up to 128 MB



RAM. Voice editing is done via the Trim/Loop function keys; the five rotary encoder knobs on the front panel double as push-button switches to create loops and breakbeats in real time.

Options include a SCSI interface, internal hard drive and standard SIMMs RAM expansion. Effects, a low-frequency oscillator and full MIDI implementation round out the features of the A3000.

For information, contact Yamaha at (714) 522-9011 or circle Reader Service 72.

JL Cooper DAW Controllers

JL Cooper Electronics is out with two new controllers for computer-based digital editing systems: the MCS-3000 and the BB3.

The MCS-3000 is the flagship product in the Cooper controller line. Sixty user-programmable keys, five rotary encoders, a full-size numeric keypad and shuttle/jogwheel offer direct control over many editing programs.

The unit is compatible with Digidesign, Sonic Solutions, Spectral, Merging Technologies, SADiE, Soundscape and others. It is also compatible with popular MIDI sequencer programs. The faux granite base shown in the picture is optional.



The BB3 is an inexpensive, compact controller that operates machine control functions by MIDI messages. The device is small enough (7.45 x 1.65 x .6 inches) to fit right onto a computer keyboard. It can control most MIDI-equipped recorders and sequencers, including ADAT, DA-88, DA-38, all Akai DR products and the E-mu Darwin.

For information, contact JL Cooper at (310) 306-4131 or circle Reader Service 71.

Spirit Monitors

Spirit by Soundcraft introduced the Absolute Zero compact nearfield monitor for studio use. With eye-catching red driver elements, the Absolute Zero can handle 75 W RMS, has flat on- and off-axis frequency response and boasts a computer-assisted-design crossover network. A deep 30mm voice coil on the woofer features a carefully optimized suspension allowing high levels of low frequencies.

The soft-dome tweeter is driven by a ferrofluid-cooled voice coil mounted on a specially shaped waveguide. The vented cabinet has a large port for



extended low-frequency response, even at high levels. The design results in high-definition time-coherent audio.

For information, contact Spirit by Soundcraft at (916) 888-0488 or circle Reader Service 83.

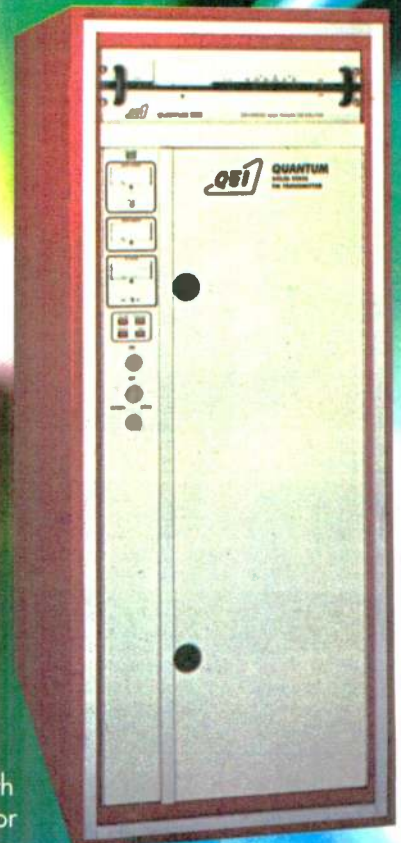
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Radio Gets the Glow With Tubes

John W. Diamantis

When it comes to audio processing and sound manipulation for a radio station, almost anything goes. The participants in the installation and adjustment of said devices are sworn to secrecy, usually with a blood oath.

To get the sketchy details I finally obtained from these secret agents of sound, I had to resort to begging, pleading, promises of anonymity and disbursements of huge sums of cash and contraband.

I was seeking answers to the question, "What are the applications for vacuum tube-based equipment in today's radio station?"

If you have been following developments in studio equipment over the past two or three years, you know that the resurgence in tube-based equipment is enormous.

From microphones to mic preamps to processors, equalizers, line amps and power amps, from hybrid solid-state and tube designs to full-tube implementations, you've never had more choices for tube-based equipment.

Tube mic preamps are popular because they are a cost-effective way of coaxing that "warm tube sound" out of a moderately priced microphone. Units are available in every price range.

All-tube units must be mounted where

they will not be subject to vibration: their high-gain circuits will magnify any microphonic problems. (*Editor's note: "Microphonic," in this instance, refers to the undesirable nature of the elements inside the tube to detect and amplify mechanical vibration the way a mic would.*)

Tube compressor/limiters are popular in the mic chain, where they produce the same "warming" characteristics. Some engineers and announcers also prefer the way certain units sound, especially certain vintage (read expensive) units. New units are priced from \$400 to a whopping \$4,000.

That's nothing. Vintage units can run

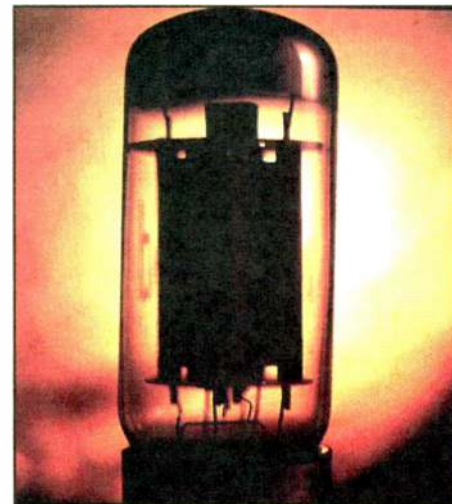


Photo by Alan R. Peterson

as high as \$25,000 for the mystical Fairchild 670, and that's the price before refurbishing. Be prepared to do tube matching and meticulous adjusting with some units.

In the production room, you can put these processors to good use doing anything a solid-state unit can. Again, some units have strong aural personalities that may be just what you need to punch up that vocal track.

If your current monitor amps make your ears crazy after a couple of hours of high-decibel screeching, try a high-powered tube amp. A quality unit will not smooth out a lousy mix, but for most folks, their smoother midrange presentation is a welcome relief.

If you are really adventurous, try a vacuum tube mic. Many start at around \$1,500, with mics from Sony and Neumann checking in at around \$6,000.

They are not as fragile as you would think. While I was auditioning an AKG C12 for a feature in *RW*, the production director could not believe how "live" the voice cuts sounded. He cried when I had to send it back.

If you are really adventurous, try a vacuum tube mic.

Only the bravest of souls have put a vacuum tube-based product in their air chain. Folklore and lack of experience tell us that tube equipment is unreliable and that tubes wear out.

In truth, tube equipment — both new and old — can be unreliable, just as solid-state equipment can be. Happily, these units have been the exception in my experience. And while tubes do wear out, good tubes in good circuits can last two, five, 10 or even 20 years or more before needing replacement.

Are you using a 10-year-old piece of equipment that has broken down at least once? Be adventurous! Stick a pair of old "Level Devils" in your air chain! Spend some bucks and put a new Demeter or Manley audio processor in line.

Who knows: maybe you will like them so much, you'll go all the way and have a completely all-tube air chain.

■■■

John Diamantis is chief engineer for WFVA(AM)/WBQB(FM), Fredericksburg, Va.

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Keeping Busy in Small Markets

Sallie Schneider Sauber

Working as a production director for a small-market commercial station in a college town has shown me a couple of things.

One, nowhere else could the "grass is greener" syndrome be more true. Voices come and voices go.

They come in — tongues hanging out, tails wagging and stars in their eyes — ready to work hard, long hours, and even weekends, for low pay. All too often, though, these aspiring young jocks venture out shortly thereafter, stooping to the call of anything that seems bigger and better than Athens, Ohio.

Second, I have learned that the key ingredient to any good commercial, locally done or nationally produced, is the voice itself. All the technology in the world will not sell a product for the announcer who cannot. This is something that is difficult to teach. It is comparable to having a natural ear for music. It is not just bad inflection or emphasis on wrong words.

Check your hormones

The first thing a new kid wants to know about our SAW multitrack is "Where's the reverb?" They all seem to be born with the idea that promos and commercials are incomplete until

saturated with reverb and testosterone. But with jocks running through the revolving door, merely getting the spot onto the hard drive is a feat in itself for them, let alone how not to read like an announcer.

For about six months, mine was the

invent different people doing different styles.

The sophisticated older woman who delivers the message slowly with a smile and with just enough enunciation to make you know that "diamonds ... are forever."



Sallie Schneider Sauber: So Many Hats, So Little Time

only female production voice I had to work with. This meant developing straight reads in several styles.

I don't mean character voices. I had to

The always-on-the-go working mommy type that says it all in one breath. The thirty-something, down-to-earth type with a completely laid back "I'll-get-there-when-I-get-there" delivery. You believe her because it comes from some-

one who has been there. Bottom line: Take it or leave it.

To me, a straight read has to be conveyed by a real person. Real people are believable. You can trust a real person. "Announcer guys" are fooling nobody. The in-your-face, sing-songy, "such a deal" delivery is better suited for used car sales than for radio.

When I am crunched for time, rather than place calls from the always outdated staff roster for a voice to say, "brought to you by Cheese Insurance." I will just as soon do the multiple voices myself.

Some critics will say it is not good to be too diverse. A talent agent once told me she loved my demo but could not tell which voice was the real me, and that bothered her.

"Actually, all the voices are mine," I replied. She then told me to cut my hair or I would never make it in the voice-over business (???)

If it is not good to be diverse, does this mean the less diverse you are, the better you are? I say no, and I believe success speaks for itself. My work includes projects for Ohio University, two TV stations, a Columbus ad agency, pre-recorded liners for an out-of-market country station and several hundred commercials here at my own stations.

One head, many hats

Another thing I've learned here in small-market radio is to try on as many hats as possible. Wear each one long enough to see if it really suits you. If you find more than one looks good on you, do

See SMALL, page 44 ▶

Vacuum Tubes: New Glory Days Are Here

Alan R. Peterson

The electronic vacuum tube continues its reign as the Comeback Kid of audio.

Dr. DeForest's "Audion" (his name for the triode) was patented in 1907 and was the basis for further developments that made radio itself possible. Now, some 90 years after the birth of the vacuum tube, manufacturing plants are turning out "bottles" again for Svetlana, Whirlwind and others. Audio product manufacturers could not be happier.

Many companies have been producing tube preamplifiers for several years. Prices can be as low as \$100 for dual-channel tube/chip hybrids. Some can rocket beyond \$10,000 for European imports. Most live in a more comfortable region such as the Aphex "Tubessence" line and products from Rolls-Bellari, either of which can be found priced reasonably in the hundreds.

Tubes often share chassis space with digital circuits. Signal processors made by companies such as DigiTech include 12AX7 tubes to "round off the corners" of digitally-processed audio. Compressors and preamps made by Joemeek and A.R.T. have rediscovered designs incorporating opto-isolators and tube circuits.

The renewed popularity of the vacuum tube is due in part to designs that run at lower operating voltages. A classic "tubey" sound can now be

achieved at 40 V or less instead of 400. Heavy power transformers have been replaced by low-voltage supplies and multiplier circuitry, making a tube preamp or limiter as effortless to handle as any 1 or 2 RU device. Hybridizing tubes with silicon op-amp components offers soft-clip and saturation while matching levels and impedances to other solid-state devices in the chain.

With some exceptions, tube preamps and processors are more likely to be found in radio production rooms and recording studios than in live, on-air applications such as consoles or airchain processing.

Air studio designers must consider issues of fragility, reliable performance, ventilation and transparency of audio quality.

However, the production staff can use tube processing to great effect to warm up lifeless mics, sterile-sounding tracks and music recordings by injecting subtle amounts of harmonic distortion and amplitude limiting. The effect can almost resemble analog tape.

Because of this, tube processors and preamps are desirable in the hands of an audio artist who can use such devices to achieve a desired result.

Tubes may not operate as warm to the touch as they once did, but that does not stop them from being hot items. Investigate who is out there and what they are doing with Dr. DeForest's wonderful invention.

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Circle (47) On Reader Service Card

Musical Cheers for Engineers

Alan R. Peterson

In our Jan. 22 issue, you read that my boss Luci Cobo and I differed on the inclusion of a plumber's wrench in the new logo for John Bisset's *Workbench* feature. Her argument favored the side of engineering that must also take station plumbing tasks into account.

It is not that I thought it didn't belong there; just that I thought someone grabbed the first wrench they saw in the clip-art book and flew it in without realizing what kind of wrench it was.

A nice chrome set of metric sockets would have been my choice. But the more I thought about it, the more I realized she was right and the completed artwork bore it out.

Satellite dishes have huge hex nuts that respond only to a large, intimidating wrench. Coax connections to the antenna must be maintained. And then there is the temptation to give the night jock a pop in the head just to find out if it really sounds like the steel barrel-like clang found in Three Stooges movies.

That monstrous wrench is for lots more than a quick rendition of "It's My Potty and I'll Cry if I Want To."

Thinking can be hazardous

Trouble is, the more I thought about it, the deeper into it I got. Out of all the people working at the station, how did the engineer get stuck with plunger duty? Seems to me the *operations* manager would be my first choice, based solely on the sound of the person's title.

The poor station engineer has endured tests, RF burns and years of sleepless nights and hard knocks. He or she has gone through Elements 1, 2, 9 and several I have not heard of yet.

There is radar endorsement, SBE

membership, maybe a paper delivered to a professional organization or perhaps a national conference. So what is this noble, important person's major responsibility at the station? Shaking the bird's nest out of the station's neon sign, but only after making sure the bathrooms have enough paper towels.

Get out the sheet music to 'If I Only Had a Brain' from 'The Wizard of Oz.'

In many instances the engineer is now responsible for more than the two stations he or she once had under one roof. Clearing jammed cassettes out of the sales manager's demo machine and explaining why a space heater's polarized plug only works one-way is bad enough. Now there could be as many as five tower sites to juggle and maintain. Maybe more.

Because some of my best friends are station engineers — and because I am certain this will eventually end up in a few local SBE newsletters — I am taking it upon myself to give an unsolicited musical tip of the hat to you underappreciated sparkplugs out there, those of you who must be equally adept at grid dip meters, soap dispensers, ISDN and furnace filters.

Call CBS Radio and ask Charles Osgood to loan you a banjo. Then get out the sheet music to "If I Only Had a

Brain" from "The Wizard of Oz." Plunk out this happy tune for the corporate big-wigs the next time they ask you for a "description of your duties."

Well-deserved

Remember, for all those sidewalks you salted and microwave popcorn fires you put out, you've earned it.

*I'm the guy who takes the beatings
At live remotes and meetings,
When signals won't go through ...
(da-dum-de-diddle-de-dum)
All 'cause someone at the party
Dropped a sandwich on the Marti,
Now we have no R-P-U.*

*I replace your dead fluorescents,
Give jocks computer lessons,
And fix the toilet too ...
(da-dum-de-diddle-de-dum)
When I come back from the tower
All you say is "Take a shower!"
And you haven't got a clue.*

*Oh, I — can't tell you why —
You think my cuffs are nerdishly high,
When the hard drive's on the blink,
Whom do you call?
Whom do you think?*

*I resolved your wow and flutter,
Cleaned leaves out of the gutter,
and lubed your squeaky chair ...
(da-dum-de-diddle-de-dum)
I returned your ancient phasor
Just as sharp as any razor
Thank the stars you're on the air.*

*I know IBM and Apple,
I can clean the board of Snapple
The morning guy sneaked through ...
(da-dum etc)
'Cause the dummy spilled his bottle.*



*Now our air console is shot, I'll
Have to see what I can do.*

*Oh, I — can tell you why —
That $\sqrt{P/R}$ is I,
and that π is three-one-four;
So what do you say?
"Please oil my door!"*

*I'm no "loser" nor a "quitter,"
but I beg you reconsider
The cuts you plan to do,
(da-dum yatta yatta)
If the FM starts to blink, then
Wave goodbye to all your income ...
(dramatic pause ...)
... Can I talk "raise" with you?*

Greetings From Athens

► SMALL, continued from page 43
not be afraid to wear more than one hat, just not all at the same time.

My hats include production director, traffic director and copywriter. I divide the day, and carefully manage the time devoted to each department. Traffic orders are not inserted between copywriting projects, and production orders are accepted only when in writing. This is the only way to keep it all straight.

Aspiring young radio people just out of college do not always realize that small-market radio is often the stepping stone to better things.

The late newscaster Jessica Savitch and Fox network sportscaster Tom Brenneman both passed through WATH(AM)-WXTQ(FM) early in their careers.

The key is to withhold the urge to jump from small-market production director to big market PSA assistant. You are not likely to shoot up the ladder the way you might at a smaller station. Wear the small-market production director hat a while. Learn before venturing over to the other side of the fence.

Who better to understand that green grass baloney than me? This is my third time back at this station and it is not greener. But I am working on it.

Production Director Sallie Schneider Sauber keeps busy at WATH and WXTQ, Athens, Ohio. Reach her at (614) 593-6651.

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For more information on the products shown below, circle the appropriate Reader Service No. (S) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

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PRODUCT EVALUATION

Korg RM8 Speakers 'Highly Useful'

**Bruce Bartlett
with Jenny Bartlett**

This compact monitor could be a fine choice for broadcast production suites. The Korg RM8 has a clear, forward sound that helps you hear any glitches or poor edits in an audio program.

A component of Korg's SoundLink DRS Digital Recording System, the RM8 can also be used with other components. It is magnetically shielded to prevent interference with computer monitors.

Body by Boston

The RM8 was designed and built for Korg by Boston Acoustics, a respected name in home stereo speakers.

A 2-way ported system, the RM8 has a 7-inch woofer made of copolymer with a butyl surround. This bass unit is called DCD, which refers to the Deep Channel Design of the pole plate.

According to Boston Acoustics, the deep channel gives the voice coil extra room to travel without bottoming.



Korg RM8 Monitor Speakers

The woofer crosses over at 2,800 Hz to a 1-inch soft-dome tweeter made of Kortec. This is a silky fabric coated underneath with a stiffener for enhanced transient response and self-dampening. An acoustic resonator over the dome smoothes its response.

In appearance, the RM8 bears a resemblance to the Alesis Monitor One. They both have a gray vinyl MDF cabinet and a rear-mounted port. When I tapped on the Korg box, it had a bit of ringing.

Dimensions are 15 x 8.5 x 10.5 inches and weight is 16 pounds each. On the back is a pair of easy-access five way binding posts.

Korg specs the RM8 at 8 ohms impedance and 88 dB/W/m sen-

sitivity, which is on the low side. Suggested amplifier power is 15 to 125 watts. Frequency response is rated as 48 to 20,000 Hz ± 3 dB.

Supplied with the RM8 is a manual which clearly describes powering, connections, phasing, cables, and placement. Korg recommends that the speaker be placed behind the mixing console with the tweeter at ear height.

Tests

In my studio, the RM8s sound best about 6 inches from a damped rear wall, 4 feet apart, 4 feet away and toed in just slightly. I played several CDs and master tapes through the RM8s before making any measurements. These are my impressions:

- Piano: Fairly natural, clear hammer attacks.
- Acoustic guitar: Clear, well defined.
- Voice: Slightly breathy and sibilant.
- Drums: Crisp, good presence, strong attacks.
- Kick drum: Clear click sound.
- Bass drum roll: Some weight, but less than bigger speakers have.
- Cymbals: Slightly harsh or aggressive. Transparent.
- Percussion: Crisp, a little harsher than more expensive speakers, but not bad.
- Sax: A bit edgy, but with warmth.
- Bass: Tight, fairly deep and uniform. Not boomy. Deep bass notes have some audible doubling (2nd harmonic distortion).
- Electric guitar: Strong bite, aggressive.
- Strings: Slightly hard or strident rather than lush and liquid.

My mixes translate pretty well to the RM8s, but sound stronger in the midrange and a little thinner in the bass than I remember.

Overall, the RM8 sounds clear, punchy, and forward; something like the Yamaha NS-10.

In the lab

Using a Crown TEF-20 analyzer, I measured the Korg RM8 at 1 meter, halfway between the woofer and tweeter edges. I measured from 300 Hz up at 1 meter to exclude room reflections and measured the woofer and port nearfield.

This yields the response in half-space, as when the speaker is near a large mixing console.

Figure 1 shows the anechoic frequency response of the RM8.

It measures 50 Hz to 20 kHz ± 3 dB, very close to the spec. There's a broad bump around 1,000 Hz and a smaller one at 4 kHz. These anomalies give the speaker its clear, slightly aggressive sound.

At 30 degrees off axis (not shown), the response is down about 2 dB above 1,000

Hz, and rolls off above 12 kHz. This indicates fairly wide dispersion.

In Figure 2 we see the Energy Time Curve, which is related to the transient response. Although the direct-sound spikes of the tweeter and woofer are sharp, they are not signal-aligned. You would not expect that in this price range.

Finally, Figure 3 shows Total Harmonic Distortion vs. frequency at 90 dB SPL. At this level the RM8 is clean above 40 Hz (THD is less than 3 percent). But at 95 dB SPL (not shown), THD exceeds 3 percent at 32, 40, 150 and 400 Hz. You would not want to drive the RM8 too loud.

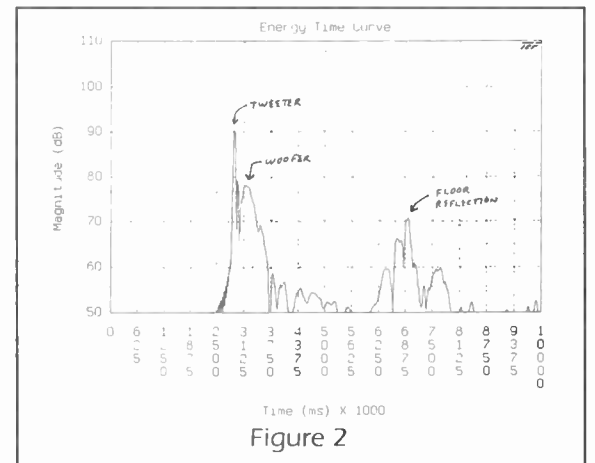


Figure 2

Summing up, the RM8 is a good performer in its price range. The enhanced midrange gives music a slightly aggressive character, but it also helps you hear things clearly.

If there is any glitch in your audio program, it will knock you over the head! In

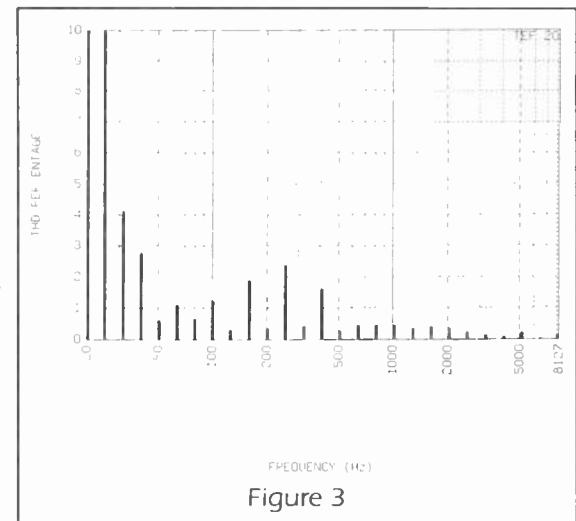


Figure 3

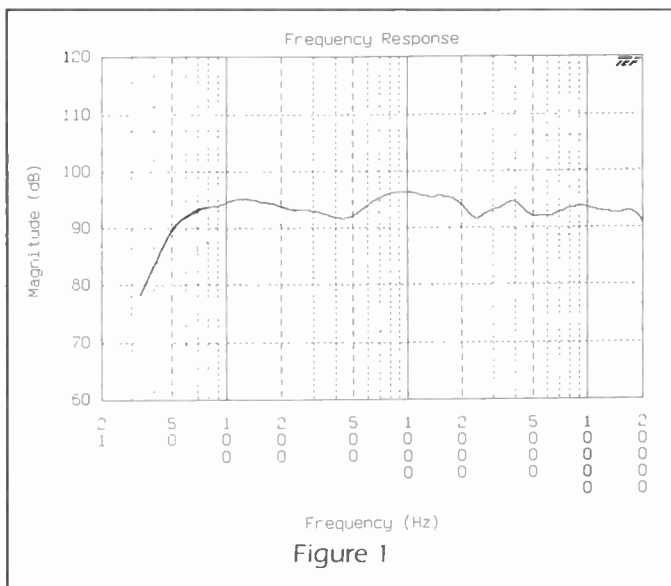
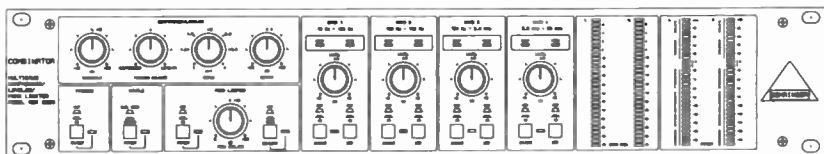


Figure 1

DON'T AUDITION THIS PROCESSOR



unless you are prepared to buy it! Once you put it on your station, you will never want to take it off.

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Korg RM8 Monitors

<p>Thumbs Up</p> <ul style="list-style-type: none"> ✓ Low distortion at 90 dB SPL ✓ Good performance for price ✓ Punchy and clear 	<p>Thumbs Down</p> <ul style="list-style-type: none"> ✓ Slightly harsh or forward ✓ Deep bass is weak (normal for small speakers)
---	--

For more information call Korg USA at (516) 333-9100, or circle **Reader Service 61**

that sense the Korg RM8 can be a highly useful tool.

Price is \$420 per pair. Korg USA is at 316 South Service Rd., Melville, N.Y. 11747.

■■■

Bruce Bartlett is a mic engineer, writer and recording engineer, and the author of "Practical Recording Techniques" published by Butterworth-Heinemann. Jenny Bartlett is a technical writer. Bruce can be reached at (219) 294-8388.

Running Radio

Add Sizzle
To Your
Hot Clock
See Page 56

Radio World

Resource for Business, Programming & Sales

February 19, 1997

Through the Years With Wink

Alan Haber

Radio, it turns out, is more than simply a warm, friendly voice to millions of listeners; it's also a proving ground for television game show hosts. Take it from Winston C. Martindale, better known as Wink.

Martindale, who picked up his nickname from a childhood friend, has worn the prerequisite outfit — natty jacket and million-dollar smile — on 19 television game shows during the past 31 years, including the blockbuster "Tic Tac Dough" and his latest tube berth, the National CableACE-award winning "Debt," airing on Lifetime Television.

Fascination

Radio, said Martindale, is "where you learn how to ad-lib ... where you learn the rudiments of your trade." Kids are always asking him how they can become game show hosts; he tells them to try getting a radio job.

Martindale knows what he's talking about: he's been in radio on and off for 45 years. His latest gig is Jones Satellite Networks' satellite-syndicated "New Music of Your Life" network.

Martindale was fascinated with radio in his childhood. He recalls sitting in his bedroom at home in Jackson, Tenn., a seven-year-old kid making believe a stick was a microphone, pretending he was on the radio. "It fascinated the hell out of me that you could talk into a piece of metal and somebody could hear you on the other end, on the radio," said Martindale.

Opry and soaps

He listened to a cadre of broadcasts, including the "Grand Ole Opry" on Saturday nights. He remembers putting his ear "in the radio — my Dad had one of those old console radios and I'd pretend I was the announcer on the Grand Ole Opry."

He also listened to the soap operas and dramas that came out of the radio speaker and imagined he was a part of them.

Young Wink first met a microphone when he was a 17-year-old high school senior. He began working at WPLI(AM) after bugging its manager (and his Sunday school teacher) Charles "Chick" Wingate for a job. Martindale earned the princely sum of \$25 a week for reading the news, doing play-by-play, and anything else that needed to be done on the 250 W station.

"I learned how to do everything, you know," said Martindale. "I did everything like most announcers do in a small town."

Hired on the spot

Martindale stayed at WPLI for about a year. He subsequently put in about six months at WTJS-AM-FM (programming was simulcast on both stations). WTJS, owned by the Jackson Sun newspaper, stood for "Watch The Jackson Sun," something Martindale would not be doing for much longer.

After spending about a year and a half at 5 kW WDXI(AM), the third of the three stations in Jackson, Martindale moved on to Memphis, about 85 miles away. The year was 1953.

Martindale sent his audition tape to Gordon Lawhead, the program director of WHBQ(AM). Soon after, Martindale's father drove him to the station, which was located on the mezzanine floor of the Chiesa Hotel in Memphis, for a meeting with Lawhead and the late Bill Grumbles, who would become



Veteran DJs Casey Kasem, Gary Owens and Wink Martindale cup ears at the 1996 NAB Convention

Martindale's mentor. Lawhead and Grumbles hired Martindale on the spot.

Memphis was Martindale's dream city. WHBQ "was the station that all of us kids in Jackson listened to because it came into Jackson like a local," he said. The station played what Martindale calls "vanilla pop."

Artists like Eddie Fisher, Kay Starr and Jo Stafford were the order of the day, and a world away from the coming rock 'n' roll revolution.

Two weeks after that meeting, young

See WINK, page 52 ▶

Traits of FM Radio Waves

Ed Montgomery

This is the fifth installment in a multipart series intended "to make the new generation of FM broadcast station managers aware of the equipment for which they are responsible and to help them periodically review how the equipment is operating." The previous installment appeared in the Feb. 5 issue.



Over the next two installments, we will examine the propagation and characteristics of radio waves, specifically FM VHF. You should understand the characteristics of these waves to understand better what happens when the VHF signal is transmitted.

When radio was discovered, the signal was created in an alternator, similar to one in an automobile. The

See FM, page 51 ▶



Sixty Years of Guidance

Cast members of the television show "Guiding Light" gathered at The Museum of Television & Radio in New York to commemorate the program's 60th anniversary, re-creating a "Guiding Light" radio script that originally aired Feb. 16, 1937. The radio version of the soap opera aired from 1937 to 1956. CBS Radio and CBS Radio's website aired the re-creation.

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MANAGER'S NOTEBOOK

Are You Truman, or Hitler?

Sue Jones

When we begin to define the qualities of a good leader, charisma usually is on the top of the list. Every general manager wants to look like a charging calvary general or a dashing Elvis Presley, or be as popular as Madonna.

True leadership is a means of achieving desirable goals. History is full of charismatic leaders like Stalin, Hitler and Mao. All were charismatic leaders who convinced their followers to pursue the leaders' goals and then led them to inflict more evil and suffering on humanity that has ever been recorded.

Effective leadership does not depend on charisma. Some effective leaders include Presidents Lincoln and Truman. Harry Truman was a staid, unflashy politician. His Missouri demeanor certainly made his victory over Dewey, with its famously incorrect newspaper headline, even more dramatic. Abe Lincoln was considered a raw-boned, uncouth backwoodsman by many in his time. Neither would be included on a list of charismatic people. However, both of these leaders successfully led the country during some of its most difficult times.

Having the coveted charisma trait is often the undoing of many leaders. It

makes them inflexible, convinced of their own infallibility, and unable to change. This is what happened to Stalin, Hitler, and Mao.

Define the goals

Effective leadership is hard work that continues daily. One of the most important building blocks of leadership is thinking through the station's mission, defining it, and establishing it clearly and visibly to the staff, clients and listeners. The effective general manager sets the goals, sets the priorities, and sets and maintains the standards.

Effective leaders understand that

adjustments and compromises are necessary. They are painfully aware that they are not in control of the universe and must be flexible enough to adjust to events and remain true to the station mission. The misleaders — Stalin, Hitler, Saddam Hussein — suffered from the delusion that the world revolves around them. Before a true leader adjusts the course or compromises, he must think through what is right and desirable for meeting the station objectives.

The distinguishing factor between a real leader and a misleader are goals. The compromise a true leader makes with the constraints of reality (political, financial or people problems) must be compatible with the station mission and goals. If a leader makes a compromise that supports his or her personal agenda instead of the station objective, he is not an effective leader. It may work for a period of time, but eventually it will contribute to deteriorating performance.

Real leaders also set the example with standards. They hold fast to a few basic standards that are reflected in their own conduct. To misleaders, standards are just for the staff or what they think they can get away with. Leona Helmsley is a good example of a misleader who thought that only little people pay taxes.

True leaders see leadership as responsibility rather than rank and privilege. Effective leaders are rarely "permissive." But when things go wrong — they always do — they do not blame others. An effective leader knows that he, and no one else, must assume the ultimate responsibility. Truman's statement "The buck stops here" reflects a true leader taking responsibility.

Another trait of a true leader is that he or she is not afraid of strength in department heads or other staff members. Misleaders are afraid of strong and capable subordinates. It is evident in their purges. True leaders are well aware of their strengths and weaknesses. The wise ones seek people who can help them compensate for their weaknesses so the station as a whole is stronger.

The effective leader wants capable department heads and staff. She is always encouraging, coaching and pushing them, and takes pride in them. Because a true leader holds herself ultimately responsible for the mistakes of her staff, she also sees the triumphs of her staff as her triumphs, rather than seeing them as threats.

Risk, and trust

True leaders seek able, independent and self-assured people. You cannot do it all and be competitive in the market. Acquire the best talent available, within your budget, to assure your success. Micro-managing mediocre staff who only do and reflect what you say will exasperate you, because they are afraid of independent action even if the situation warrants it. True leaders praise and promote their subordinates and are delighted with their high performance. The general manager knows the value of the contributions a capable person is giving the station.

The true leader is aware of risk. Capable people tend to be ambitious but he realizes that hiring them is a smaller risk than to play safe with mediocrity. Mediocre stations lose market share in a competitive environment. An effective leader knows his ultimate role is to create energies that contribute to the vision and goal. If he is successful, the staff can

See LEADER, page 51 ►

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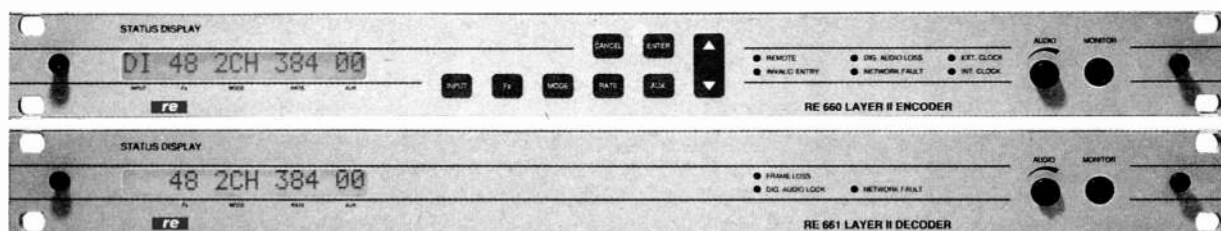


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5 DUNCAN'S RADIO MARKET GUIDE
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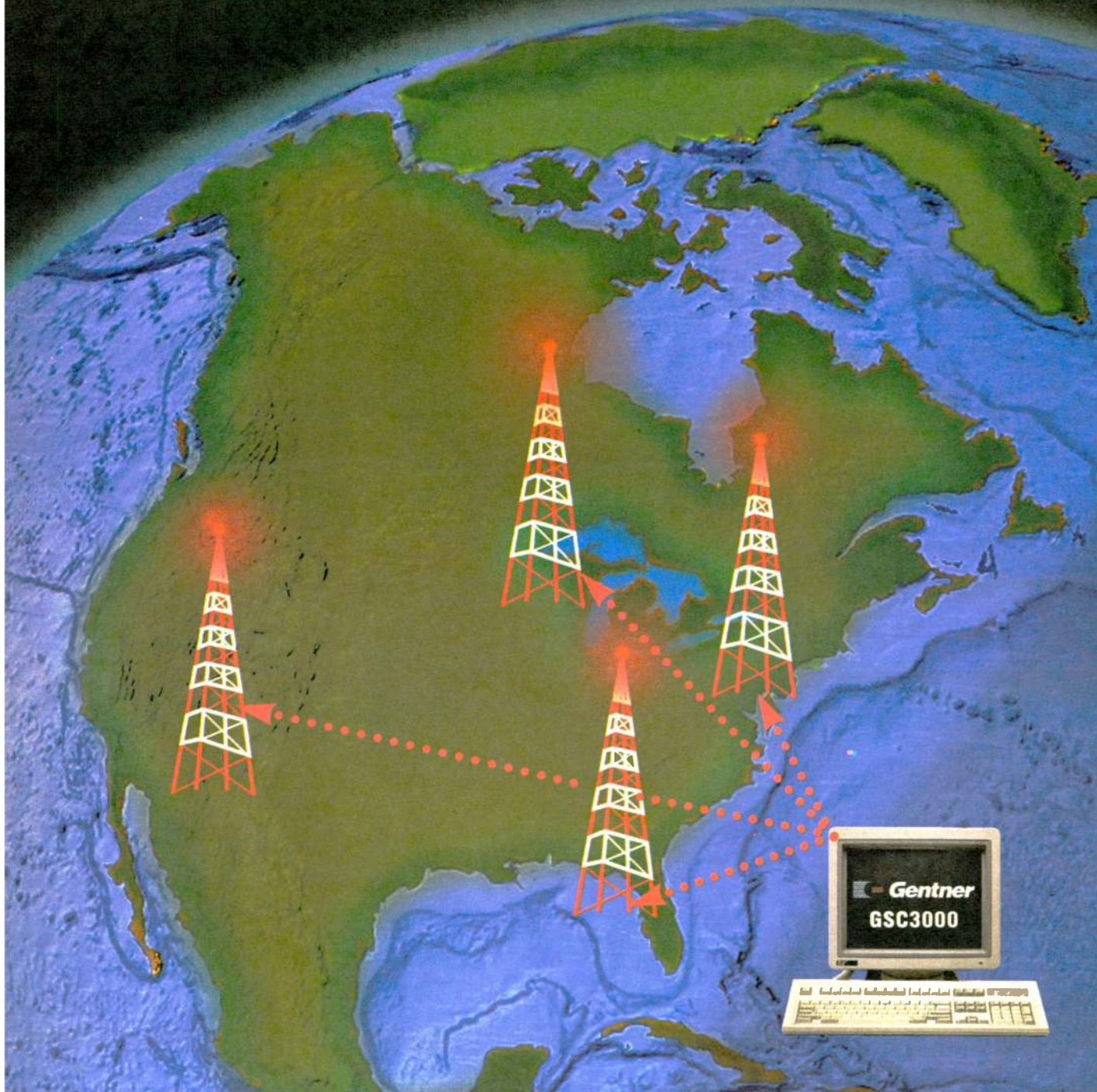


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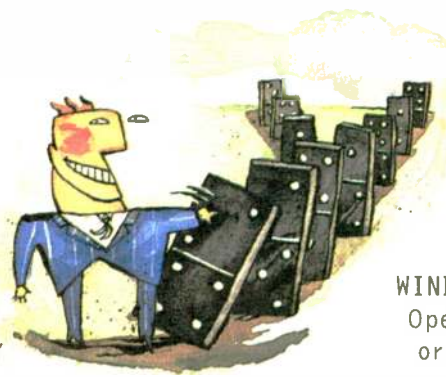
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Wave Characteristics

► FM, continued from page 47

radio signal is nothing more than electric current flowing back and forth through a wire that is not terminated, or connected to a motor, light bulb or some other device requiring electricity.

The electric current creates a magnetic field that radiates away from the antenna, perpendicular to the current flow, as shown in Figure 1. The 19th-century physicist James Clerk-Maxwell theorized that electricity and magnetism create a signal that travels through space similar to light.

Heinrich Hertz later proved this in a laboratory, but it was Guglielmo Marconi who made radio more than just a curiosity. The original frequencies used were very low, requiring extremely long antennas. These radio waves were quite reliable but not practical to use. Low frequencies tend to penetrate almost anything. They are still used by the Navy to communicate with submarines.

As radio developed, the alternator gave way to the oscillator developed by Edwin Armstrong. This permitted experimentation with higher frequencies.

By the early 1920s, the medium-frequency band was in use. It was easier to work with and created a radio wave that traveled along the contour of the ground. This was the band on which AM "standard broadcast" transmissions were located.

Use of the medium-frequency band had a side effect. Signals were reflected off the ionosphere quite reliably after sunset. This permitted the signal to "skip," reaching receivers hundreds of miles away at night.

As a result, some stations could only operate during daytime hours or use directional antennas at night, to reduce interference with stations located some distance away.

As radio research progressed, the high-frequency band was discovered. This band produced a very poor ground-wave, but the skywave would reliably bounce back to earth thousands of miles away. It was often defined as "short-wave" because the wavelength was not as long as the medium-wave signal.

This is the band of international broadcasting, still used today to provide an essential service.

In the 1930s, radio engineers began experimenting with frequencies above the high-frequency band, in an area they defined as Very High Frequency (VHF). The radio signal began to change characteristics around 30 MHz. Predictable sky-wave reflection ceased, and there was no groundwave. VHF is essentially a line-of-sight transmission medium.

No practical purpose

Many thought these radio frequencies were useless. Edwin Armstrong used them to experiment with FM. With the proper antenna connected to a receiver, they could compete with the standard broadcast signal. Researchers spent much effort on VHF FM, studying the travel of the radio wave through the air. This effort continued through the 1960s.

All radio waves propagate in a specific spatial orientation to the earth. Horizontally polarized waves are oriented parallel to the earth; vertically polarized waves are perpendicular to the earth.

At first, FM broadcast in the



At left is an example of a mast-mounted, high-gain, circularly-polarized FM broadcast antenna. At the base of the mast, mounted to the side of the tower, is a single-element FM back-up antenna.

United States used horizontal polarization. Initial research indicated that a horizontally polarized VHF signal was less likely to be affected by terrain variations and buildings. Subsequent study indicated horizontal polarization was less likely to change its polarity when it reflected off of objects.

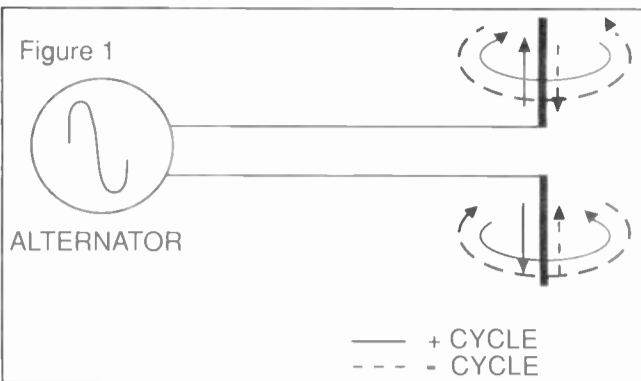
There appears to be some truth in that to this day. In the early 1960s, the Federal Communications Commission permitted FM stations to add vertical polarization, mostly because of automobile FM receivers with vertical antennas and portable radios with small whip antennas. They work well in the primary service area of the broadcasting station. In small, Walkman-type receivers, the FM antenna often is the wire connected to the headphones.

The FCC authorized the use of

circular polarization in the late 1960s. Circular polarization combines the transmission of horizontal and vertical radiation in one antenna. A trusted consulting engineer who is familiar with VHF transmission can advise you about the type of antenna that is best for your needs.

The VHF wavelength in the FM broadcast band (88 to 108 MHz) is about 9 feet. Most FM broadcast antennas are much shorter, and configured to radiate equally in all directions or in a nearly circular horizontal pattern.

The antenna also produces radiation at vertical angles as well as horizontal. If just one bay or element is used, much of the radiated signal is wasted



An antenna is nothing more than a conductor that is not terminated. When the unterminated ends are cut to distance equal to the wavelength of the radio signal, or a division of the wavelength and spread apart, the magnetic field will radiate away in free space.

As radio developed, the alternator gave way to the oscillator.

skyward and downward. Most broadcasters attempt to get greater efficiency out of their signal with a high-gain antenna.

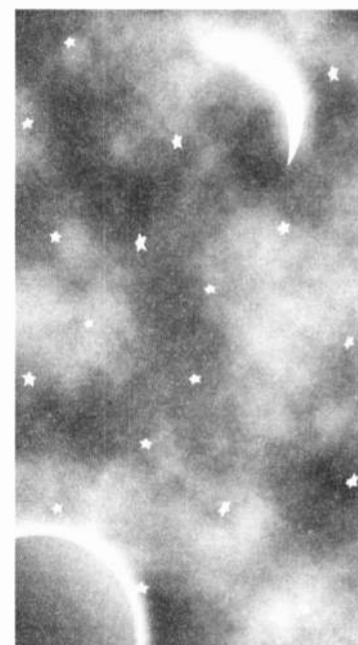
High-gain antennas have advantages and disadvantages of which you should be aware.

In the next installment, we will discuss this topic as well as transmitter location and antenna height. These important factors all exert influence over a station's coverage.



Ed Montgomery is lab director at Thomas Jefferson High School for Science and Technology in Alexandria, Va., and a part-time radio engineer. He also taught college-level broadcast engineering technology and has written educational columns for RW. Contact him via e-mail at emontgom@lan.tjhsst.edu

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► LEADER, continued from page 48

carry the ball if the leader is not there, especially in emergencies.

At some point, the true leader will move on or retire. If she has been an effective leader, one of the subordinates should be able to assume the helm successfully and continue the vision. The station should not fall apart, nor the ratings plummet.

An equally important trait of effective leadership is to earn trust. Your staff will not follow your direction, or will do only the minimum, if they do not trust your judgment and vision. Do not confuse being liked by your staff or constant agreement with you as trust. A true leader does not need staff to like him or always agree with him. He is orchestrating them to work toward the shared goal.

Trust also is the conviction that the leader means and does what she says. This is the basis of an old-fashioned concept: integrity. If you tell the staff that you will promote from within, then hire the next three people from

the outside while passing over qualified staff members, you will destroy your integrity and your staff's trust.

A true leader's actions and professed beliefs must be harmonious, or at least compatible with, his actions. Effective leadership is not based on smart looks or cleverness. It is based on being consistent. Staff members do not like inconsistent changes in directives and goals any more than leaders like surprises. A general manager's inconsistency in directives or station objectives will lead to confusion and frustration that significantly reduce productivity and will drive top performers away, possibly to your competitor.

Compare your leadership qualities with these to see if yours may need to be adjusted.



Sue Jones is a principal in Bisset Communications, a communications management firm located in the Washington area. Contact her at (703) 503-4999.

Survival: Canadian Case Studies

James Careless

For years, about half of Canada's radio stations have been losing money, the victims of tough economic times and stiff competition for ad dollars.

However, Canadian radio stations are finding ways to cut costs while staying on-air. Here are three case studies in radio survival, Canadian style.

British Columbia

Nanaimo, British Columbia, is a small city located on Vancouver Island, off the west coast of Canada in the Pacific Ocean. Until recently it was served by two stand-alone AM radio stations: CKEG at 1350 kHz and CHUB at 1570 kHz. Unfortunately, the city was also serviced by a storm of powerful AM and FM signals drifting over from Vancouver, Canada's third largest radio market.

"The stations in Nanaimo were either very marginally profitable or losing money," said CKEG General Manager Bob Adshead.

Battered by these signals, the stations' respective owners, Central Island Broadcasting and Benchmark Ventures, decided that if you can't beat 'em, join 'em: They decided to join, forming a 50/50 partnership and merging their stations into the new Nanaimo offices of CKEG.

More importantly, the new company moved strongly against the Vancouver invaders by winning an FM license for the community. Known as CKMV, the new FM station replaced CHUB, which went dark. This added a locally owned, competitive FM signal to the market without splintering the already weak advertising base further.



The two companies accomplished more. After signing off CHUB, they moved CKEG to CHUB's 1570 kHz slot, which offers better coverage than 1350 in Nanaimo. This, in turn, allowed them to help out Benchmark's Parksville AM station CHPQ.

Before the deal went through, CHPQ was using "a small 1,000 W transmitter



that didn't serve the communities it had been licensed for," said Adshead. "You couldn't pick it up in some of the areas. Certainly it wasn't as strong a signal as off-air signals coming in from Vancouver."

To solve this problem, Benchmark hauled the old 10,000 W CHUB transmitter to Parksville. When it was turned on, signal reception improved dramatically.

By joining forces, the managers of Nanaimo's two radio stations made life

better for themselves. They've been able to turn two weak AM stand-alones into a financially healthier AM/FM combo, while reducing staff and overhead costs by moving into one building.

"The two stations are doing better than what the former two stations were doing. In turn, it's also made the AM station in Parksville stronger, because we've been able to improve the service to the marketplace by (increasing) the station in Parksville to 10,000 watts," Adshead said.

If profits are hard to come by in major Canadian markets, the task is even harder in the country's small towns. Many of these have been living through hard times for years, especially in remote areas hurt by poor worldwide prices for their natural resources. The dilemma for broadcasters is to find ways to stay on-air while living within the meager revenue streams that do exist. One company that has got a handle on this problem is Pelmorex.

Unprofitable combination

Based in Mississauga just west of Toronto, Pelmorex owns and operates 12 radio stations in northern Ontario. When purchased by current owner Pierre Morrissette, these stations had many things in common, said Don Shafer, Senior Vice President of Pelmorex Radio Inc. First, "each (station) was a stand-alone operation, operating with autonomy and operating independently of each other." Second, "most of the radio stations were unprofitable."

"When you look at that combination," he said, "it begs the question: Is there another more economical, more practical way to operate?"

The answer is networking, something that Pelmorex has gone for in a big way. In fact, with the recent purchase of Rogers' Satellite Radio Network, the Pelmorex Radio Network has grown nationwide to nearly 240 affiliates using one of a number of music services offered by PRN.

However, Pelmorex executives knew that they risked alienating their listeners by turning their properties into network repeaters. They didn't want to solve one problem only to create a second. The company installed the Arrakis Systems Gemini system to feed the network. The Gemini takes its music from a bank of remotely controlled CD-players, and all other audio clips from hard drive. It then delivers this audio to each station by satellite.

The system is effective because each station also has its own hard drive. The network announcer can custom-record localized audio clips for each market, fed out during off-hours, for insertion during network feeds.

"Our announcers voice the commercials," said Shafer. "Our announcers voice the IDs, and the positioning statements. Our announcers will do the local traffic, the local weather, and many of the parts that can be done usually ahead of time of the program, and retrieved on demand with the addressable platform that we use."

"So while one radio station is doing a public service announcement, the other radio station is talking about an entertainment piece, and another radio station is talking about doing something completely different, and another station could be

taking a second commercial," he said. "It really is a cut-and-paste approach to programming, where we provide the parts, (and) the stations decide where they want to put them."

By combining the advantages of networking with the sound of local radio, these broadcasters are succeeding. "It's been a long hard road, but we're finally turning the corner," said Don Shafer.

The Windsor market

Located across the river from Detroit, Windsor in Ontario is a broadcasters' graveyard. That's because Detroit, the sixth-largest market in the U.S., has a population of 5 million, while Windsor has 250,000.

Inundated by U.S. signals, Windsor radio stations face a clear challenge. "If you're going to be successful in Windsor, you've got to be successful in Detroit," said local broadcaster Wayne Stafford.

For a time, this was indeed the case. CKLW(AM), known as "The Big Eight," was a pop music powerhouse in the '60s and early '70s. But music started moving to FM, and when it did, the Canadians lost their edge. Canadian FM stations must play a minimum amount of "Canadian content" music, a requirement that may help the national identity but limits Windsor FMs trying to take on Detroit.

So CKLW and its sister station, CKLW-FM (now CIMX), shuffled from format to format, said Stafford. But when it came to making money, "they just couldn't do it: (that's why they) had it on the market for two years, and it was going to go dark."

Enter CHUM Limited, one of Canada's major radio chains and owner of the two other Windsor stations,



CKWW(AM) and CIDR(FM). Faced with similar problems, CHUM managers decided that the only move that could save Windsor radio from extinction was a bold one: namely, for one company to own and operate all of the city's four radio stations.

There was no precedent for such a move in Canadian broadcasting, where the government still frowns upon duopolies. But no other Canadian market faced the same problems as Windsor, and the Canadian Radio-television and Telecommunications Commission approved the deal. CHUM now runs all four Windsor radio stations from a single building.

By doing so, the company was able to realize immediate economies, said Stafford, who acts as general manager of the four stations for CHUM. It let go about a dozen people in jobs such as accounting, reception and engineering.

The move also allowed management to reformat the four stations into complementary niche market formats, those considered too small or too Canadian for the Detroit stations to want to touch.

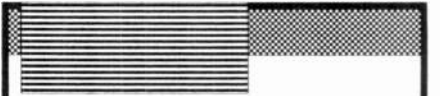
Although not overwhelming, the

progress achieved since the merger is noticeable. The stations have increased their listenership share from 24 to 28 percent (which means, of course, that Detroit stations own the majority of the Canadian audience).

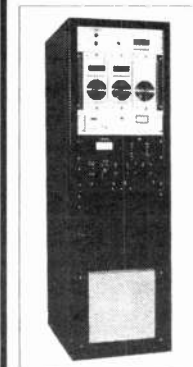
Also, "the other operation was losing a tremendous amount of money," said Stafford. "We've been able to work ourselves to almost a break-even after three years. And hopefully if things continue the way they're starting out this fiscal year we'll start to turn a profit."

■ ■ ■

James Careless is a frequent contributor to RW. He has written recently about CBS Radio coverage of the Super Bowl and the plans made by radio news networks for the inauguration of President Clinton. Reach him at (613) 258-1398.



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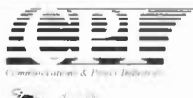
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READER SERVICE NO. 118

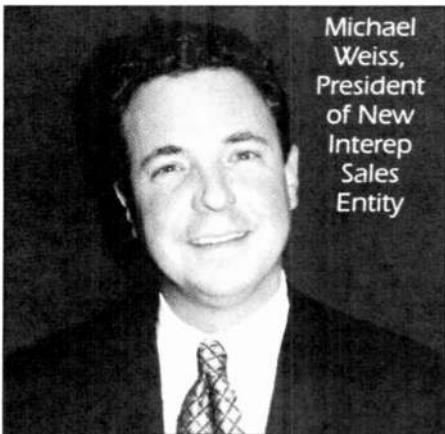
STATION SERVICES

Companies with new product announcements for Running Radio Station Services should send them to:
Radio World, c/o Running Radio Editor, P.O. Box 1214, Falls Church, Va. 22041

Interep to Rep All CBS Radio Stations

Interep is now the sole sales organization for all 79 CBS Radio stations. Interep added the 23 stations represented by CBS Radio Representatives. The company said this creates the largest national radio sales organization.

With the additional stations, Interep



Michael Weiss,
President of New Interep Sales Entity

becomes the sole national sales organization for all CBS Radio stations. Now operating under the Interep umbrella are: CBS Radio Representatives, Group W Radio Sales and two Infinity Radio sales teams.

These four teams form a new entity, still unnamed. Serving as president of the new entity is Michael Weiss.

For information contact Helene Blieberg at CBS Radio, (212) 975-3771; or circle Reader Service 80.

SW Networks Picks Up San Diego Classic FM

Sony's SW Networks has picked up an affiliate for its Classic FM format in the nation's 14th-largest market.

The 24-hour classical music format began airing Jan. 1 on KFSD-FM San Diego, the former KOWF. It is the ninth station to pick up Classic FM, which was introduced in 1995.

The Classic FM play list consists of more than 6,000 tracks. "We use a custom-mixed and dayparted strategy to accommodate listeners' different moods for different times of the day," said Anthony Rudel, vice president of programming for Classic FM, SW Networks.

Rudel said Classic FM packages classical music in "an accessible, AOR style."

Morning host Fred Child is new to the Classic FM team; he is a former host and producer for WNYC-FM New York and KBVR(FM) Corvallis, Ore. Child airs from 6 to 10 a.m., followed by Kaaren Hushagen from 10 a.m. to 3 p.m. and Dennis Elsas from 3 to 6 p.m.

For information contact Mary del Grande at (212) 833-8441; or circle Reader Service 82.

Grammy Awards Covered by MJI

Celebrating its 12th year as the Official Worldwide Radio Network of the Grammy Awards, MJI Broadcasting offers its most extensive coverage of the awards, from the announcement of nominees through backstage proceed-

ings following the Feb. 26 Grammy Awards show. MJI carried the Jan. 7 announcement of Grammy nominees from the Ed Sullivan Theater in New York. Nine separate two-hour programs focusing on nominated songs and artists in different music formats were offered as pre-Grammy special broadcasts. Hosts include jazz saxophonist David Sanborn.

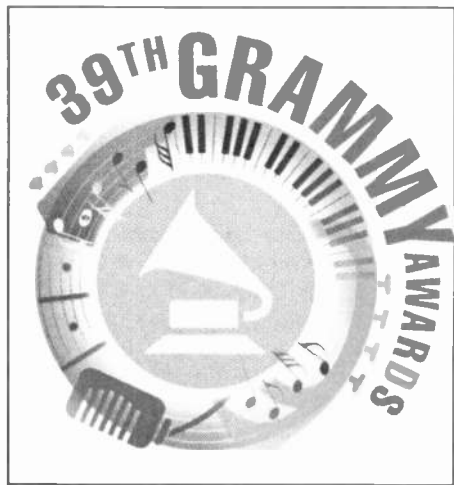
MJI also produced "Countdown to the Grammys," a series of short-form promotional features. From Feb. 24 to Feb. 26, 24 radio stations from around the country will participate in the Chevrolet Camaro Grammy Week

"Super Remote" event, live from the Roseland Ballroom in afternoon drive. The stations have had the chance to broadcast live from New York and conduct interviews with top music talent, arranged for this event.

In conjunction with "Super Remote," MJI and Chevrolet will give away a 1997 Camaro to one listener.

MJI Broadcasting has been the official radio network of the Grammy Awards since 1985 and the Country Music Association Awards since 1992.

For information contact Tom Senif at MJI, (212) 245-5010; or circle Reader Service 81.



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Mark Lapidus

The hot clock. It's a tool that allows radio to construct the content logically in any given hour. The mistake most easily made by program directors and promotion directors alike is to allow their own designs to become stale, predictable and inflexible.

Many programs directors are in the comfortable habit of closing the door and working on clock design by themselves. But it's dangerous for the entire process to occur in a vacuum. Why? Because programmers are professionals who listen to radio differently than Joe Potatoes. Joe

probably views radio as light entertainment (at best) and isn't hanging on to every word or song delivered. When you're ready to redesign, print out all your hourly clocks, call in your entire station brain trust, and discuss how to freshen the architecture of your sound.

Learn from your clients

Liners and promos: Here's where we can take a lesson from advertisers. Our clients, who want the most bang for their buck, look for three things: first placement in a stop-set; plenty of frequency; and excitement in delivery.

A major point of discussion should be

placement of *any* type of promotional announcement at the end of a stop-set. I've argued with programmers until I'm blue in the face about this age-old programming move. In placing a promotional announcement after the last commercial, the station always has call letters going back into music, but that's why we have jingles and professionally recorded IDs. There is no better place to put a promo or liner than *prior* to commercials or between songs. PDs are kidding themselves if they think most of the audience is paying attention after they've suffered through as many as five minutes of commercials.

Next we have the issue of frequency. How many times do you have to air an announcement before a typical listener catches it three times? Most stations don't ever check. The answer may directly affect how many promos you put into an hour clock. Come to think of it, when's the last time your promotion director walked into the programmer's office and demanded an increase in that day's promos because of an extremely important event the next day? Maybe it's never happened because the PD is totally inflexible about adding units.

This is not a good thing. Most stations air one recorded promo and one live liner per hour. Maybe your station needs more or maybe it needs less. Don't air generic boring announcements just because they're scheduled. And while your jocks might use some coaching on their enthusiasm, good placement and frequency as needed will make the message stand out.

Stop-set placement: If you're like most, your commercial stop-sets are in the same place every hour. While this is the easiest method, it may allow a sharp competitor to beat you in and out of breaks. You have to adjust your stop-set positions regularly. While this can be time-consuming and disruptive, it can also be highly effective in improving your TSL. During a group discussion you may learn that your sales manager can even eliminate stop-sets during certain hours or months! I frequently hear stations air only one or two commercials in a stop-set and still do three of them per hour just because "the clock" dictated three stop-sets that hour!

Special features

Songs: The placement of special song features is a good place to begin discussion. A programmer may not really care where he places a daily Beatles feature, but a salesperson may have more luck selling it if the feature is set in the right day part. Perhaps all your competitors are doing a lunch-time request hour and there's no way you'll ever capture that position. Your general manager might suggest another lunch feature that will change your clock.

Weather clocks: Do you have a "bad weather clock" for morning drive? When snow hits, your morning team has no choice but to go with the snow. Have a structure ready and waiting in the control room. Sure, it may only happen ten times a year, but at those times people really *are* paying attention! Speaking of which, are you promoting your most important feature just prior to school-closing information?

Competitive advantage: Naturally the more information you have about your competitor's clocks, the better you're able to design your battle plans. If you don't have access to a monitoring service, you may want to have interns tape and transcribe a 24-hour day. A VCR set at slow speed, hooked up to a tuner, can record six hours at a time. Also have them write down song titles. This information is useful later.

The common thread here is that open discussion of hourly hot clocks leads to broader issues.

Winners have open minds and proactive agendas. Too many in the radio industry wait for falling ratings before even considering a fresh look at present structures.

You may decide that everything is as it should be, which is also OK. But if your clock ain't runnin' at the right speed, man, you'd better go catch it.

TELLING IT LIKE IT IS ...

...about DAD^{PRO}, the Digital Audio Delivery system that's ideal for both Production and On-Air, whether Live Assist or Automated, small market or large



"In our pre-purchase research, we found that the most common compliment paid to competitive units was that their technical support staffs were always there when the system crashed. When we talked with DAD users, they hardly knew anyone at ENCO since their systems had never gone down. That's the kind of compliment I was looking for! DAD's segue editor feature revolutionizes automation. We pre-program the entire station, then the talent previews and customizes their breaks to give us a totally live feel. Plus, we simulcast both stations and DAD lets us easily set up separate spot schedules. It's major market ready, and built like it."

Philip Urso, GM
WDGE/WDFG,
Providence, RI

"We've had five DAD workstations in action for over a year, and I really don't know how we could get along without the system. It allows all three of our stations to present a consistent on-air sound and frees the talent to concentrate more on communicating with the audience. We're still finding new and innovative ways of using the system a year later. In my opinion, if you're planning on automation, you can't do it RIGHT without ENCO!"

Chris Andree, Asst. PD
WWKL/WYMJ/WCMB,
Harrisburg, PA

"We're a news programming provider and deal with a large number of actualities every day, so speed in production and getting it down the line are paramount. DAD allows us to bring information in, and seconds later it's ready to go. The greatest feature is the ease of editing and file transfer between our four workstations. On-air is a breeze."

Dane Wilt
Radio News Company,
Las Vegas, NV

"Way cool. The greatest thing about DAD is that it acts and thinks like a cart machine and doesn't intimidate the talent. We use touchscreens, and the learning curve is about 2-1/2 hours before they're up and running. From an engineer's standpoint, it's great because DAD uses off-the-shelf hardware, so maintenance is a snap."

J.R. Rogers, Asst. CE
KSON/KIFM,
San Diego, CA

"The DAD system was on the cutting edge of systems we looked at, and there was some initial reluctance to enter the digital arena. After having the system in-house for a month, the entire production and on-air staff felt like they could never do without it again. Now our news staff has a system of their own, and we're getting a third system for our sister TV station."

Chuck Whitaker, PD
WSBT, South Bend, IN

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ACOUSTICS

Want To Sell

ERI 2 bay ctr feed, tuned to 93.7, will work at 95.5, 93.7 or 93.9, new in 1992, \$4500. H Slumway, KSWG, 801 W Wickenburg Way, Wickenburg AZ 85390. 602-254-6644.

Cablewave 240' of 1-5/8" air Heliac cable, excl cond, BO; Andrew & Cablewave dehydrator, excl cond, BO. R Weigner, WRAP-LP, 29 Douglas Dr, Meredith NH 03253. 603-279-4758.

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FAX: 773-539-3500

ERI 1100 12 bay, high power tuned to 99.5, in warehouse near St Louis. \$6500; (2) rejection filters, 12" long, 10" diameter, 98.5 kHz & 99.5 kHz, \$500 ea. Windcharger 150, 300', triangular, 19" sides, beacons & side lights avail, \$4000. J Googan, KGNV, POB 87, Washington MO 63090. 314-239-0400.

ERI 2-bay center feed, tuned to 93.7, new, \$3000/BO. H Shumney, KSWG/KBSZ, 801 W Wickenburg Way, Wickenburg AZ 85390. 520-684-7804.

ERI FM-L 3E, tuned to 93.5, 10 yrs old, medium power, full wave, \$1500. J Murphy, WJQZ, 82 Rail Road Ave, Wellsville NY 14895. 716-223-3591.

Rohn 45G 190', \$500. R Newton, WAYM, POB 887, Brentwood TN 37024. 205-837-5276.

COAX, 1/2", 75 ohm, 2000', never used, best offer. Will sell shorter pieces at \$3.50/foot. Megastar (702) 386-2844.

Want To Buy

6-8-10 bay CP FM antenna at or near 105.1 mHz. B Campbell, KACO, 415 Beaumont, Ardmore OK 73401. 405-223-6797.

Socket for 620 W beacon bulbs. B Hawkins, WENS, 950 N Meridian St, Indianapolis IN 46204. 317-684-8411.

ERI FML-3 3 bay FM antenna system on or close to 93.9. RJ Miller, Miller Media Group, 111 W Main Cross, Taylorville IL. 217-824-3395.

AUDIO PRODUCTION

Want To Sell

Dolby 361 Type-A NR, 2 chnl, mounted in sturdy road case, complete package, \$800. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

Drawmer DL-241 gate/compressor/limiter, brand new, \$250. E Malek, Starbeat, 9 E Larkdale Dr, Deerfield IL 60015. 847-945-9500.

JBL 4410AL studio reference monitor speaker w/orig box & papers, \$280. R Evans, WPFJ, POB 1335, Franklin NC 28734. 704-369-9196.

Electro-Voice Sentry 100A 1 pr studio monitors, excl cond, in/out, \$275 + shpg. E Toline, Audio Etc, 525 W Stratford Pl, Chicago IL 60657. 773-975-6598.

Neve 33114 bdct module, mic pre EQ w/24V pwr supply, excel, \$1000. M Schackow, Mark Schackow Recdg, 307 4th Ave E, Lemmo SD 57638. 605-374-3424.

Akai DR4D 4 trk digital editor, like new, \$990. R Forsythe, Soundchoice, 2904 Prairie Ln, Lafayette IN 47904. 317-449-8201.

AKG BX20E echo chamber w/R20E remote & manual, excel cond, \$2900; Burwen 1500A noise filter, gd, \$125; Bogen amps, 10W, 30W, 35W, tubes 35W solid state, \$30-\$80; AKG C451E condenser shotgun system, 5 capsules, 2 xmtrs, 3 shock mounts, case, etc, working well, \$455, all +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

Audiometric 2.8 audio distribution amplifier Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782 8591.

Cart racks (2) each holds 400 carts. \$125/ea. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

dbx 263 De-Esser inexpensive single-chnl unit, intended to remove excess sibilance from voices, \$100. L Albert, MSU-TV, Box 2266 Univ Sta, Murray KY 42071. 502-762-4664.

Gentner SPH-3 phone hybrids (3) w/manuals, \$300/ea. R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568. 217-824-3395.

Ramsa WR-S 212 12 chan audio mixer w/3 band EQ, sweep mid & 3 aux sends, excel cond, \$995; Lexicon LXP-5 multi FX stereo processor, performs reverb, delay & pitch FX to audio program, excel cond, \$300; Fostex 4030 & 4035 synchronizer & remote, excel cond w/cables, \$750; Samson MR-1 wireless MRI rcvr w/TX-3 xmtr w/Sony Lav mic & Samson hand held trans w/EV 757 mic, all excel cond, \$500. N Madeo, Madeo Multimedia, 304 Bentley, Brewster NY 10509. 914-278-6401.

Shure mono mixer, \$100; Shure 610 feedback controller, \$85. D Kocher, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18103. 610-776-1455.

Tascam MM-100 rack mount stereo mixer, 8-chnl, 4 effect sends & receives, w/manual, \$250/BO. K Carlson, Q Audio, 540 Blue Lakes Blvd N #614, Twin Falls ID 83301. 208-734-0695.

JBL 4333A 15" speaker, \$950/pair; Vintage recond tube mic pre's & mixers, \$300-\$700; ADC new patch bays, 1/4" to 1/4" 52 points, \$169; ADC TT bays, \$129 up; ADC new TT or 1/4" TRS cords, \$9; Furman 1/4" to 1/4" patchbays, \$95 ea; like new tape, 1/2"x2500' 456, \$15 ea; 1" 456, 226, 250, \$25 ea; Rane ME15 graphic EQ, \$150; Digitec 3.6 sec delay, \$150; new pwr dist/filter rack mt, \$75. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want To Buy

Compressors & EQ's, tube & solid state. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

AUTOMATION EQUIPMENT

Want To Sell

SMC 350 Carousels (6), as is, \$50 ea. R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568. 218-824-3395.

SMC 3 Carousel 450's, 24 trays ea. 3 dual cart drawers, MSP-12 controller, DAS-12 audio switcher, complete w/video mon, keyboard, in 2 bay 6' rack w/manuals. M Smith, KOPY, POB 731, Alice TX 78333. 512-664-1884.

Arrakis networked Digilink III w/Cartwall for live assist in studio, Digilink w/Trak Star hardware for prod studio, call for specs or info, excel working equip, \$11500. L Zeve, WHYL, Box WHYL, Carlisle PA 17013. 717-249-1717.

Harris 9002 operating when taken out of service in Nov, 14 yrs old w/extra system for parts, \$1000; SMC 350 (3) carousels, mono, random select, \$80 ea; ABC 1600S 16 event sequencer, \$100. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

SMC 350 Carousels, as is (6), \$50/ea. R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568. 217-824-3395.

Want To Buy

Digital DJ audio cards & computers, used B Campbell, KACO, 415 Beaumont, Ardmore OK 73401. 405-223-6797

SMC RC-50 50 event programmer for Carousels, must be cosmetically straight & w/manual, need not work. K Carlson, Q Audio, 540 Blue Lakes Blvd N #614, Twin Falls ID 83301. 208-734-0695.

CART MACHINES

Want To Sell

BE 2100CRPS stereo cart R/R, excel cond, \$1000/BP +shpg; BE 2100CPS stereo cart reproducer, excel cond, \$600/BO +shpg. Jeff or Andrew, Emerald Snd Stds, 103 16th Ave South, Nashville TN 36212. 615-312-0511.

Fidelipac CTR 124 stereo R/P, like new, \$1500/BO. Jeff, KTKK, 2470 N Fairfield, Layton UT 84047. 801-771-4271.

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ITC rack shelf for 99 Series, \$25. D Bailey, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

ITC Delta 11053 (3) stereo cart reproducers, BGE T1 cart timer w/ea, excel cond, \$1250 ea/BO +shpg; ITC Delta 11319 (2) stereo cart R/P w/(2) ITC Delta 11319 14628 stereo cart record unit, BGE T1 cart timer w/ea pr, excel cond, \$1800 ea pr/BO +shpg. Jeff or Andrew, Emerald Snd Stds, 103 16th Ave South, Nashville TN 36212. 615-312-0511.

Tapecaster 700-P, recond; ITC WP & RP; Gates/Harris 994-6701-002; Harris 994-6815-001 (2) w/Criterion compact rack mount. M Smith, KOPY, POB 731, Alice TX 78333. 512-664-1884.

Amplex AG440 capstan motor, \$150. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

Harris R/P, \$500; Harris play, \$300. JP Cave, WLCC, POB 387, Luray VA 22835. 800-296-2283.

ITC 3D (3) decks, PB only, mono w/3 tones, \$225/ea; ITC ESL-IV splice finder, \$100; Spotmaster cart winder, \$75; Audicord Series A mono R/P w/3 tones, \$125. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

ITC 3D WP SP 99B mono & stereo, BO. Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782-8591.

Scully 284-B 8-trk 1" in gd shape, \$3500 + shpg. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

Spotmaster TFIA cart winder, \$50. M Taylor, KNEO, 10829 E Hwy 86, Neosho MO 64850. 417-451-5636.

ITC upgrade pb to record, amps only, no deck, 3 tone, stereo, \$175, or mono, \$125. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

ITC record amps, 3 tone, stereo, \$250 or mono \$150. W Gunn, 619-320-0728.

ITC Delta - new pinch rollers: Mono playback (2), record/play (2), stereo record/play (1). MOTIVATED! Spotmaster series 2000 record (1). Wes, 818-798-9128.

Want To Buy


ITC, BE, Fidelipac cart machines: single, triple, mono, stereo, play & record/play. Call M O'Drobinak @ 619-758-0888.

CONSOLES

Want To Sell

Arrakis 1505C 6 chnl stereo audio console w/18 balanced inputs, \$400. M Gollub, WMJS, POB 547, Prince Frederick MD 20678. 410-535-2201.


MCI JH416, prewired w/Morgan cable, 18x16x4x2 w/producers desk, documentation/manuals, spares, excel cond, \$3000; Audionics pwr supply for console, \$100. D Bailey, RockShoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.



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Spirit Live/4 mixing console, 12x4x2 w/2 addtl stereo inputs & 5 Aux buses, custom modifications and in excel cond, \$1600; Mackie 1604 mixer w/expander, 16 mic inputs, tape-return-to-monitor, near new cond, \$850. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

Ampro 5 chnl, 2 buses, 8 chnl, 2 buses, \$100/both. JP Cave, WLCC, POB 387, Luray VA 22835. 800-296-2283.

Audioarts/Wheatstone 8X power supply w/phantom, excel cond, \$200. D Kochoer, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18103. 610-776-1455.

Grommes G5M (2), 6 chnl mixer, tube type, like Altec 1567A, \$300 ea; Ramko DC5AR, checked, \$300. J Parsons, Parsons Sound Service, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

Harris Stereo 80, Auditorics 110 Grandson modules, Harris Micro Mac, CCA & Sparta slide-type boards. Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782-8591.

McMartin B-500 5-chnl mixer, \$200. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

RCA BN-17A port remote 4-chnl mixer, removable front cover w/handle converts to own carrying case, original RCA manual incl, \$250. L Albert, MSU-TV, Box 2266 Univ Sta, Murray KY 42071. 502-762-4664.

Shure M-67 mic mixer, gd cond, \$200, will pay shpg. R Meyer, 805-962-8273.

Tascam 208 8x4, \$650; M216, 16x4, \$1000; TOA RX308 8x4, \$1000. M Hughes, Fresh Start, 896 W 11th St, Panama City FL 32401. 904-784-2146.

Soundcraft 600, 32x16, w/patch-bay, mint, \$6950; Tascam 512, 12x8 mixer, \$750; Tascam 520, 20x8x16 mixer, \$1750; Allen & Heath SYNCON 28x24, great sound, \$8000; Ramsa 820 mixer, \$2200. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Rockwell Collins 5, 8 or 10 chnl stereo or mono; LPB Signature II or III, 5, 8 & 10 chnl stereo or mono consoles. A Sutton, WCRS, 637 E Durst Ave, Greenwood SC 29648. 864-223-8553.

Tascam or Otari 2 or 4 trk r-r, mono cart machines, slider stereo on-air consoles, etc. in excel cond. Media Arts Ctr, 1-800-887-2346 or fax 860-677-1141.

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Aphex Compellor 320A leveler, compressor, stereo mdl, new in original box, \$495; Orban digital Optimod 2200D, as new, \$3400. P Christensen, Christensen Prod, 11142 Raley Creek St, Jacksonville FL 32225. 904-739-3899.

CBS 410 Volumax limiter w/manual, \$50. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

dbx 163 overeasiness compressor/limiter, inexpensive single chnl unit, uses 1/4" phone plugs, \$100. L Albert, MSU-TV, Box 2266 Univ Sta, Murray KY 42071. 502-762-4664.

Langevin AM 5301 Leveline limiter/compressor, 4 tube w/manual, gd, \$425 +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

UREI LA4 racked pair, silver face w/manual, xlnt cond, \$1400/pr. M Schackow, Mark Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

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RCA 74 ribbon mic, chrome & black, also other RCA & Shure mics; RCA 77 & 44 "Forks". B Mayben, WRGA, 104 E 6th Ave, Rome GA 30161. 706-291-9742.

RCA Junior velocity in excel cond, just re-ribboned, \$800; Stromberg Carlson MD-36AS, like small Shure 55, \$200/pr; EV 664 in gd cond, \$100. M Schackow, Mark Schackow Recdg, 307 4th Ave E, Lemmo SD 57638. 605-374-3424.

AKG D160E, \$60; D190E, \$90; D19E, \$300; EV-607, \$125; 624, \$100; 644 sound spot, \$200, 1751 condenser, \$100; PL-9, \$90; DL-95, \$100; RCA-Aerodyne MI 6226 ribbon, \$600. M Hughes, Fresh Start, 896 W 11th St, Panama City FL 32401. 904-784-2146.

Audio Technica ATM61HE hypercardioid mics (4), \$90 ea; Luxo mic booms table mount (4), \$25 ea; Audio Technica 8415 shock mounts (4), \$25 ea. G Kornbluth, A&J Recdg Std, 225 W 57 St, NY NY 10019. 212-247-4860.

EV DL-42 shotgun (pair), vgc, \$325 & \$300; WE 639A birdcage, fine cond, \$675; WE 633A salt-shaker (pair), vgc, \$230 ea; AKG C567E tie tack, vgc, \$130; AKG D190E dynamic, gd cond, \$60; AKG D1000E, excel, \$60; AKG D200E cardioid (pair), vgc, \$45 ea; EV 635A omnidynamic, vgc, \$90; EV RE 85 noiseless lavalier, gd cond, \$80, other EV & Shure mics, all +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

Shure SM-7 bdct mic w/built-in windscreen & shockmount, \$200. C Smith, Action Comm, POB 21012, Washington DC 20009. 202-265-9135.

Sony C-74 short shotgun, 48V phantom, vgc, excl sound, \$475. E Toline, Audio Etc, 525 W Stratford Pl, Chicago IL 60657. 773-975-6598.

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Russ Lang RL600, excel cond, \$200; ADC Pro Patch Series, \$450; ADC Pro Patch Series, \$200. D Bailey, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

Amateur radio handbooks, yrs '67, '69, '72, '76 & '81, \$15/all. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Langevin EQ 252, 7 band on 19" panel w/1/4" in/out, excel, \$400; George Starbird mic booms (2), early 50's, excel cond, \$475 ea; Symetrix TI-101 telephone interface, excel cond, \$225; Crown IC-150 stereo console w/manual, vgc, \$150 +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

National Schools home appliance home study course, 53 booklets, \$75 +shpg. H McDonald, KKJV, POB 807, Veradale WA 99037. 509-484-4531.

Scully 250/255 Series rcdr/reproducer, R-R, (2), \$250. M Taylor, KNEO, 10829 E Hwy 86, Neosho MO 64850. 417-451-5636.

WE 111C coils, \$50 ea. WC Florian, WNIB, 1140 W Erie St, Chicago IL 60622. 312-633-9700.

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Audiopak, 40 carts, various lengths. \$.50 ea. whole lot for \$18. most w/factory seal. H McDonald, KKJV, POB 807, Veradale WA 99037. 509-484-4531.

Microtran table top tape degausser, handles 1"-2" tapes. \$150/BO; mechanical tape timers. Lyrec & Seike/Spotmaster, new & used. M Crosby. 408-363-1646.

Want To Buy

Scotchcart 2.5, 3 & 3.5 min carts. buy or trade. other brands considered. New Gold on CD or similar CD. delivered oldie shows featuring Dick Bartley, M.G. Kelley & others. B Mayben, WRGA, 104 E 6th Ave, Rome GA 30161. 706-291-9742.

For details on space availability contact Simone at 1-703-998-7600

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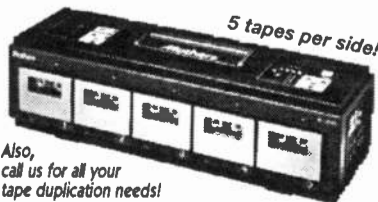
Take advantage of the huge demand for tape cassette copies of every show on your station or network! Harness untapped \$\$\$. Put the Mothers® M-2010 MARK II Series unit to work for you. This marvelous piece of equipment produces up to 10 original master cassettes right off the air or from any line source. Duplicate up to 9 studio-quality cassettes from a single cassette master in real time or 2X. Promote and sell shows right on the air or create multiple sales demos with ease and efficiency. A bottom-line builder in a box!

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Donate to peace and get a rebate. 501(c)(3) shortwave station. Radio For Peace Intl. seeks all types of prod & bdct equip. will give receipts for tax deduction & may pay shpg. Dr Richard Schneider. 503-252-3639.

Transmitter, AM or FM, exciter, antenna, STL, console, duplicator, translator, J Googan, Missouri River Christian Broadcasting (501C3), 314-239-0400.

TEST EQUIPMENT

Want To Sell

General Radio 1932 dist analyzer, vintage tube, excel. clean, check out w/manual. \$100. R Evans, WPFJ, POB 1335, Franklin NC 28734. 704-369-9196.

Want To Buy

Delta Electronic OIB-1 or OIB-3 operating impedance bridge. B Dickerson, WEAG, 1421 S Water St, Starke FL 32091. 904-964-5001.

HP audio generator, older model, prefer rack mount, will consider others. W Steinbrecher, KRBD, POB 23600, Ketchikan AK 99901. 907-225-9175.

TUBES

Want To Sell

4CX250B, 833C, 4-400, 3CX1500A7, 807, 4-125A, 4CX350A, 4-1000. EIMAC, AMPEREX, RCA, Westgate 800-213-4563.

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Quality Rebuilt Tubes
Approximately 1/2 the Cost of New

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FOR THE BEST PRICE
& 24 Hr service on transmitting tubes call Goodrich Ent Inc at **402-493-1886** day or night, FAX **402-493-6821**.

EIMAC 4CX250B \$94.50 ea
Brand New! Mike Forman,
1472 MacArthur Blvd,
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Fax (510) 530-0858 Hurry. Limited quantity

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Circle (161) On Reader Service Card

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Circle (162) On Reader Service Card

Want To Buy

Top Prices

for Duds/Used Tubes.

Call 416-421-5631

We Buy Duds/Used Tubes! Call 630-872-4445

TURNTABLES

Want To Sell

Presto 6NN lathe w/cutter head, mono or stereo w/amps, \$300-\$500. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

Russco Studio-Pro B. 45/33 w/tonarm. \$125 +shpg. H McDonald, KKJV, POB 807, Veradale WA 99037. 509-484-4531.

Want To Buy

Technics SP-15 TT w/wo arms. J Hopkins, Sunflower Studios, 4312 W 110th St, Leawood KS 66211. 913-491-9453.



Quality Power Tubes

- 3CX300A1
- 3CX2500A3
- 3CX2500F3
- 3CX2500H3
- 3CX3000A7
- 3CX3000F7
- 3CX6000A7/YU148
- 3CX10,000A3
- 3CX10,000A7
- 3CX10,000H3
- 3CX15,000A3
- 3CX15,000A7
- 3CX15,000H3
- 3CW20,000H3
- 3CW20,000H7
- 3CW30,000H3
- 4CX250B
- 4CX250BC
- 4CX250BM
- 4CX250BT
- 4CX250R
- 4CX350A
- 4CX350AC
- 4CX400A
- 4CX800A
- 4CPX800A
- 4CX1500A
- 4CX1600B
- 4CX1600U
- 4CX3500A
- 4CX5000A
- 4CX5000R
- 4CX7500A
- 4CX10,000D
- 4CX15,000A
- 4CX15,000J
- 4CW10,000A
- 4X150A
- 5CX1500A
- 5CX1500B
- 572B
- 5U4G
- 6550C
- (See SV6550C)
- 6AS7G
- 6BM8
- 6L6GC
- (See SV6L6GC)
- 811A
- 833A
- 8161R
- 8560AS
- EF86
- EL34
- EL509
- SV572-3
- SV572-10
- SV572-30
- SV572-30
- SV572-160
- SV6550C
- SV6L6GC
- SV811-3
- SV811-10
- TH5-4
- TH5-6
- TH6-3
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- YC130/9019
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- Manufactured in Russia's largest power tube factory
- Generous warranty based on high quality
- Honest prices based on quality at low cost
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Broadcasters

205-882-1344

Fax: 205-880-8077

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415-233-0429

Fax: 415-233-0439

Quality Power Tubes



Circle (164) On Reader Service Card

Radio World

Call Simone Mullins, Classified Ad Manager, to reserve space in the next issue. Use your credit card to pay, we now accept VISA and MASTERCARD.

5827 Columbia Pike, 3rd Floor Falls Church, VA 22041
PHONE: 703-998-7600 • **FAX: 703-998-2966**

Select from these categories for best ad position-

Acoustics	Consoles
Amplifiers	Disco-Pro Sound Equip.
Antennas &	Financial Services
Towers & Cables	Leasing
AudioProduction	Limiters
(Other)	Microphones
Brokers	Miscellaneous
Business	Monitors
Opportunities	Receivers & Transceivers
Cart Machines	Recorders
CD Players	Remote &
Computers	
MicrowaveEquip.	Test Equipment
Repair Services	Transmitter/
Satellite Equipment	Exciters
Software Stations	TrainingServices
Stereo Generators	Tubes
Tapes, Carts & Reels	Turntables
Tax Deductable	Positions Wanted
Equipment	Help Wanted

Classified Advertising Rates Effective January 1,

	1x	3x	6x	13x
1-9 col inch (per inch)	\$69	66	61	55
10-19 col inch (per inch)	52	59	55	50
Distributor Directory	105	100	95	90
Professional Card	74	68	62	56
Classified Line Ad				\$2.00 per word
Blind Box Ad				\$15 additional

To compute ad costs: Multiply the number of ad inches (columns x inches) by the desired rate schedule for your per unit cost. Example: a 3" ad at the 1x rate is \$207, at the 3x rate \$195, at the 6x rate \$183, at the 12x rate \$165, etc.

Circle (160) On Reader Service Card

TRANSMITTERS

TRANSMITTERS

Want To Sell

USED FM TRANSMITTERS

- Harris FM 25K 1983 vintage, excellent
- Energy Onix MK 2, 20 kW FM 1995 vintage, like new
- McMartin BF 25K 25 kW FM 1979 vintage, vgc
- RCA BTF 5B 5 kW FM 1960's vintage, clean, only \$2,595!
- FM Exciters, several available, call Chris at RF Specialties, 816 628 5959

Gates FM5H 5000 W at 92.1 w TE3 exciter, \$10,000. R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568 217-824-3395.

New McMartin 20W BFM 8000 FM exciter, New McMartin BFM10050 FM relay broadcast tower, also some used McMartin BFM exciter, 15W Goodrich Ent., 11435 Manderson St., Omaha NE 68164 402-493-1886 fax 402-493-6821

Harris MW1A AM on 1430 recent upgrades to PA modules spare kit on air \$7000 J Ferguson WCLT 674 Jacksontown Rd Newark OH 43058 614 345 4004

Collins 831G 20 kW w new 10 kW transformer 99.5 kHz Collins 310E exciter in warehouse near St Louis \$6500 J Goggan KGNV POB 87 Washington MO 63090 314 239 0400

Continental 315 RI now in service since new in Nov 82 Power Rock on 1260 kHz 1 kW cut back, \$12500 L Lanser WWJQ 5658 143rd Ave Holland MI 49423 616 394 1260

CSI 500 W AM CCA 10000 W FM Jim GWTM Inc 414 Washington, 414 Dehance OH 43512 419-782 8591

Gates FM5H 5000 W at 92.1 w TE3 exciter, just taken off air, \$10000 R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568 217-824-3395.

Harris FM300K 300 W solid state xmtr, amp only, factory record in 1992, \$1995. J Travis, WCIC, POB 506, Bath NY 14810, 607-7764151

BESCO World Leader in AM - FM Transmitters
Internacional
"Now in our 30th year"

116 AM & FM Pre-Owned Units in Stock

- ✓ ALL - Powers
- ✓ ALL - Manufacturers
- ✓ ALL - Instruction Books
- ✓ ALL - Complete
- ✓ ALL - Spares

Call and take advantage of our liberal trade-in plan. Tune and test on your frequency, available on site. Complete inventory on request.

Phone: 1-214-630-3600
Fax: 1-214-226-9416
e-mail-besco@whynet.com

Want To Buy

FM xmtrs, 3-5 kW, late mdl in excel cond D Murray, WLJQ, 1028 Woodstone Dr, Kingsport TN 37663 423 239-4745

UTC transformers M Hughes, Fresh Start, 896 W 11th St, Panama City FL 32401, 904-784-2146.

McMartin AM/FM xmtr, any model, exciter or stereo modules, Goodrich Ent., 11435 Manderson, Omaha NE 68164 402-493-1886.

QEI FM exciters and low power transmitters. Will make reasonable offer for used gear manufactured by QEI. Preferably 675 exciters or QEI exciters that were built for other broadcast companies. Call or fax (609) 232-1625 and ask for Bob Brown.

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. Simply send your listings to us, following the example below. Please indicate in which category you would like your listing to appear. Mail your listings to the address below. Thank you.

Please print and include all information:

Contact Name _____
Title _____
Company/Station _____
Address _____
City/State _____
Zip Code _____
Telephone _____

I would like to receive or continue receiving Radio World FREE each month. Yes No

Signature _____ Date _____
Please check only one entry for each category:

- I. Type of Firm
- | | |
|------------------------------|---------------------------------|
| D. Combination AM-FM station | F. Recording Studio |
| A. Commercial AM station | K. Radio Station Services |
| B. Commercial FM station | G. TV station-teleprod facility |
| C. Educational FM station | H. Consultant and engineer |
| E. Network group owner | I. Mtg. distributor or dealer |
| | J. Other |

- II. Job Function
- | | |
|---------------------------|--------------------|
| A. Ownership | G. Sales |
| B. General management | E. News operations |
| C. Engineering | F. Other (specify) |
| D. Programming/production | |

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

WTS WTB Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

WTS WTB Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

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

Broadcast Equipment Exchange

PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

Quality FM Transmitters at Reasonable Prices

20 watt Exciter	\$ 995.00	5 Kw.	\$ 24,990.00
120 watt	\$ 2,500.00	10 Kw.	\$ 29,990.00
300 watt	\$ 2,990.00	15 Kw.	\$ 35,000.00
2.5 kw	\$ 12,990.00	20 Kw.	\$ 39,990.00
STL Transmitter	2,490.00	STL Receiver	\$ 1,990.00
Both	\$ 3,990.00	20 w Translator	\$ 2,500.00

FM Antennas as low as \$ 395.00 Per Bay

Contact Jimmie Joynt / Factory Direct Sales
Ph. 973/473-2577 800/279-3326 Fax 800/ 644-5958

ADVERTISE!
in Radio World,
...
Call 800-336-3045
Ext, 154
TODAY!

TRANSCOM CORP.

Serving the Broadcast Industry Since 1978

Fine Used AM & FM Transmitters and Also New Equipment

For the best deals on Celwave products, Andrew cable and Shively antennas.

1 KW FM 1988 Harris FM1K	1 kW AM 1978 Harris MW-1
3.5 KW FM 1979 McMartin BF3.5M	10 kW AM 1986 Continental 315R-1
5 KW FM 1969 RCA BTF 5D	10 kW AM 1974 CSI T-10-A
10 KW FM 1965 Collins 830F1	10 kW AM 1980 Harris MW-10
10 KW FM 1970 Harris FM 10H3	10 kW AM 1976 Continental 316F
10 KW FM 1976 RCA BTF 10E	25 kW AM 1982 CSI T-25A
20 KW FM 1975 Harris FM20K	50 kW AM 1978 Harris MW50C3 (1100 KHZ)
20 KW FM 1974 Collins 831G2 Cont 816R2	50 kW AM 1978 Continental 317C-1
20 KW FM 1967 Collins 830H-1B	50 kW AM 1973 Continental 317C
25 KW FM 1980 Harris FM25K	50 kW AM 1981 Continental 317C-1
	50 kW AM 1982 Harris MW-50B

1077 Rydal Road #101, Rydal PA 19046
800-441-8454 • 215-884-0888 • FAX No. 215-884-0738

IF YOU WISH TO CONTACT OUR HOME PAGE,
WE ARE AT WWW.TRCORP.COM

IF YOU WISH TO E-MAIL US, WE ARE AT TRANSCOM@TRCORP.COM

Circle (165) On Reader Service Card

WHEN YOU'VE GOT 
SOMTHING THIS GOOD, YOU CAN'T
HELP BUT BLOW YOUR OWN HORN!



There comes a time when a company knows it has a break through product. And for Energy-Onix, that time is now.

The **ECO** 15-30, Single tube, High Power Grounded Grid Transmitters up to 32 KW.

- ◆ Solid State driver up to 2 KW serves as emergency transmitter
- ◆ Straight Forward field proven control system
- ◆ VSWR Protection & More

◆ BEST OF ALL THEY ARE ECONOMICALLY PRICED!



"The Transmitter People"

Energy-Onix

1306 River St, Valatie NY 12184

518-758-1690

FAX: 518-758-1476

Circle (166) On Reader Service Card

HELP WANTED

HELP WANTED

WANTED: Man and Wife Sales Team for Central Louisiana. 50% on sales. Call 318-449-9000.

Sales - Technical

Incentivized sales and technical support on new products from established manufacturer for broadcasting and cable TV. Excellent working environment in a fast-growing, high-tech company. Earn up to \$100K annually, depending on skills and experience. Full employment benefits, 401(k) and bonus.

Send resume to:
ATTN: Human Resources
530 Lawrence Expressway
Suite 531
Sunnyvale, CA 94086

Chief Engineer

KBSW-Twin Falls, Idaho

Progressive public radio network has immediate opening for Engineer. Broadcast engineer experience required; SBE cert. preferred. Salary DOE, great benefits. Call Debbi at 208-385-3906 EOE.

Dame Media INC, Group owner of 21 radio stations located in 5 markets in NY and PA is looking for aggressive, skilled individuals to round out our engineering staff. Candidates must have strong RF skills, be highly motivated, and be able to work unsupervised. FCC General Radio Telephone license or SBE certified. Send Resume to:

Paul Thurst, Director of Engineering, Dame Media INC.
PO Box 6477, Harrisburg, PA 17112. Fax (717) 540-9326

For details on space availability contact Simone at
1-703-998-7600
Ext.154

Digilink, the leading in PC based digital audio system in broadcast radio is looking for Customer Service Technicians to provide telephone support to our growing user base. Air, production, programming, automation system experience desired.

PC, MS DOS, and MSWindows experience a plus. Send resume to:

Arrakis Systems Inc.
2619 Midpoint Drive
Fort Collins CO 80525 or
FAX to (970) 493-1076

Chief Engineer for growing group of AM/FM radio stations in Colorado Ski Country. Immediate opening for full time engineer with experience in RF, digital, satellite, audio, and computers. Applicant must be able to work on mountain top sites and be comfortable with winter conditions. Includes all major benefits.

E.O.E. Fax resume to:
Rocky Mountain Radio
970-949-0266
Attn: Marty Hijmans

POSITIONS WANTED

Experienced pro worked all formats, avail now, Florida, Southeast, Western US. J.J. Shannon, 561-770-4749.

Jazz host/prod 15 yrs. seeks on-air position or syndication. Pro & proven, would like to remain in Florida or SE. Peter, 352-683-7488.

30-yr pro seeks small mkt mgmt opp in SE. broad knowledge, creative, organized, high integrity. Send inquiries to: Potential, POB 14706, Greenville SC 29610.

Big, friendly, adult voice, nice guy too. will add class to your station, news anchoring, prod, air shift, board operation maintenance. Alex, 513-777-8423.

Broadcaster since '46, retired owner, banker. Position in GA, NC, SC. POB 931053, Norcross GA 30093.

CE position wanted, 10 yr exper w/computers, transmitters, automations, DCS, UDS, digital studios, great references. F King, 702-876-5151.

Enthusiastic, energetic, mature, radio-kinda guy, strong community involvement, goal oriented & willing to relocate. Buster, 405-MRC-4184.

Semi-Fab morning AT seeks challenge, country/AC/oldies. Mike, 517-362-7251.

Experienced radio engineer, AM, FM, studios & computers seeks FT position w/small community broadcaster. Write to: Engineer, 7894 Palm Grove Ct, Indianapolis IN 46219.

Experienced on-air personality seeking position in larger market station in SE. Current trivia show host of extremely popular live, interactive show. Wilson Casey, 864-583-9009.

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

Page No.	Advertiser	Reader Service No.	Page No.	Advertiser	Reader Service No.
18	360 Systems	17	28	Gorman-Redlich Mfg. Co.	116
45	ABG	144	57	Hall Electronics	158
52	Ahead Technology	85	17	Harris	7
22	Altronic Research	8	37	Henry Engineering	142
39	Andrew Corp.	29	11	Hnat Hindes	3
35	Arrakis	50	13	Inovonics	5
40	Arrakis	30	3	Intraplex	25
54	ATI	87	24	Itelco	13
2	Audioarts Engineering	1	45	J Squared Technical Service	113
63	Auditronics	35	35	Media Casting Internet	139
37	Autogram Corporation	70	31	Media Form	27
45	Avocet Instruments	69	37	Modulation Sciences	121
14	Belar	6	42	Moseley	31
54	Benchmark Media Systems	143	26	Musicam USA	12
28	Broadcast Devices, Inc.	64	28	Myat Inc.	145
36	Broadcasters General Store	49	11	Nautel	4
37	BSI	94	54	Norsat	118
25	BSW	9	37	Nott Ltd.	89
4	Burk Technology	24	60	NOW! Recording Systems, Inc.	160
30	CDS	86	49	PR&E	43
28	Circuit Werkes	95	32,33	PR&E	52
45	Circuit Werkes	120	46	Processing Solutions	46
37	Coaxial Dynamics	91	41	QEI	48
28	Comet North America	68	55	Radio Computing Service (RCS)	40
7	Comrex	23	23	Radio Systems	14
37	Comrex	115	6	Rane	2
1	Continental Electronics	84	48	RE America	44
54	CPI	122	54	Reach Satellite Network	88
21	Crown Broadcast	15	60	RF Parts	162
38	Dataworld	28	52	Richardson Electronics	41
43	DB Elettronica	47	59	Satellite Systems	159
60	D&C Electronics Co.	161	10	Scott Studios	20
34	Denon Electronics	51	37	Shively Labs	65
51	Dick Brescia & Associates	42	19	Signal One	16
45	Econco	92	28	Silicon Valley	96
60	Econco	163	47	Sine Systems	45
56	Enco Systems	34	27	Smarts Broadcast Systems	10
29	Energy-Onix	11	15	Sony Pro Audio	19
53	Energy-Onix	33	60	Svetlana	164
61	Energy Onix	166	45	SoundAmerica Corp.	117
54	Excalibur Electronics	93	9	Telos Systems	21
8	Fidelipac	22	35	The Radio Mall	146
16	Fostex Corp.	18	61	Transcom	165
45	Freeland Products, Inc.	66	54	Videoquip Research	67
28	Gentner	90	64	Wheatstone	39
50	Gentner	32	44	Zercom	119
35	Ghostwriters	141, 114			

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Production Manager.....Lisa Hoagland
Publication Manager.....Heather Nicholson
Classified Coordinator.....Alex Frosini
Showcase Coordinator.....Vicky Baron
Ad Traffic Coordinator.....Kathy Jackson

Ad Traffic Assistant.....Anastacia Stornetta
Desktop Management.....James Cornett
Ad Coordination Manager.....Simone Mullins
Circulation Director.....Sheryl Unangst
Circulation Manager.....Robert Green
Accounts Receivable.....Steve Berto

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U.S. West, Dale Tucker.....916-721-3410 Fax: 916-729-0810
U.S. Midwest, Sandra Harvey-Coleman.....317-966-0669 Fax: 317-966-3289
Other Regions: Stevan B. Dana.....703-998-7600 Fax: +1-703-998-2966
Latin America: Alan Carter.....+1-703-998-7600 ext 111 Fax: +1-703-998-2966
UK, Benelux, Scandinavia: Phil Guy.....+44(0)1869-337508 Fax: +44(0)1869-337509
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Free Subscriptions are available upon request to professional broadcasting and audiovisual equipment users. For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review; send to the attention of the appropriate editor.

ABOUT OUR EMPLOYMENT SECTION

HELP WANTED

Any company or station can run "Help Wanted" ads for \$2.00/word or buy a display box for \$69/column inch. Payment must accompany insert, use your MasterCard or VISA; **there will be no invoicing**. Blind box numbers will be provided at an extra charge of \$15. Responses will be forwarded to listee, unopened, upon receipt. Call 800-336-3045 for details.

POSITIONS WANTED

Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a \$15 fee which must be paid with the listing (**there will be no invoicing**). Responses will be forwarded to the listee, unopened.

Mail to: **BROADCAST EQUIPMENT EXCHANGE**,
PO Box 1214, Falls Church, VA 22041 Attn: Simone Mullins



CALL NOW!

ADVERTISING SPACE IS AVAILABLE!

Call **800-336-3045**
Ext. 154
for more information!

CALL NOW!





LOOK

and

LISTEN



**TAKE A GOOD LOOK AT THE 2500 SERIES,
FASTEST SELLING SMALL CONSOLE AROUND**

Broadcasters with Major Rebuilds or minor restorations are motivated to find FEATURES, QUALITY, and VALUE. LOOK no further than the 2500 from AUDITRONICS with recent innovations and additional options which further define this Product Class.

- ◆ **SOLID STATE SWITCHING** of all signal paths
- ◆ **DC CONTROL** of all level functions
- ◆ **ACTIVELY BALANCED** input, patch points, and floating outputs
- ◆ Telephone **CONFERENCING** capability
- ◆ Easily accessible wiring on **MOTHERBOARD CONNECTORS**
- ◆ **20dB HEADROOM** maintained throughout
- ◆ Linear **CONDUCTIVE PLASTIC** 100mm faders (P & G Standard)
- ◆ External line selector with **CUE AND HEADPHONE ASSIGNMENT**
- ◆ Comprehensive **A/B EXTERNAL LOGIC** control

With nearly 30 years of supplying the Broadcast Industry with the best Audio Equipment, You will be getting the best Customer Commitment and Service available. Call today and find out just how affordable the 2500 Series from Auditronics really is.

TAKE A VERY GOOD LOOK, YOU WON'T FIND ANY BETTER

 **AUDITRONICS**

3750 Old Getwell Road, Memphis, TN USA
(901) 362-1350 FAX (901) 365-8629
GSA Contract #GS-03F-4032B

 Compliant

Some Countries Have It ALL!



WSIX - Nashville, Tennessee "Country Music Station of the Year"

A-500 Studio Furniture delivered March 1993
A-500 Console S/N 20789 delivered April 1993
A-500 Console S/N 20792 delivered April 1993
A-6000 Studio Furniture delivered March 1995
A-6000 Console S/N 22536 delivered March 1995
R-16 Console S/N 22557 delivered March 1995
SP-5 Console S/N 22593 delivered April 1995

1995 Academy of Country Music Award
1995 Marconi Country Music Award
1995 Billboard Country Music Award
1995 Country Music Association Award
1995 Country Music Association SRO Award
1995 Gavin Country Music Award
1996 Gavin Country Music Award
1996 Academy of Country Music Award

Wheatstone Model A-6000 Audio Console shown

 **Wheatstone Corporation**
tel 315-452-5000 / Syracuse, NY.

Circle (39) On Reader Service Card

World Radio History