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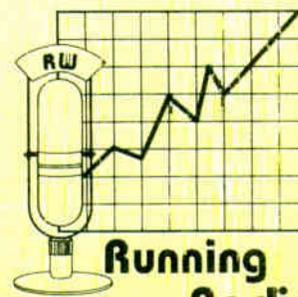
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Running Radio
See pp. 16-25

Vol 19, No 25

Radio's Best Read Newspaper

December 13, 1995

Budget Battle Stalls Bill, Buyers

by Lynn Meadows

WASHINGTON Station owners who gambled on the passing of telecommunication legislation will probably not hit the jackpot this year. But in the long haul, that may be irrelevant.

"The premise that you have to understand is that smart people organize themselves around bad laws every time," said Bill Steding, managing director of Star Media Group.

Steding said that even if the bill does not pass, group owners will figure out another way towards consolidation. He used the example of LMAs (Local Marketing Agreements) in the 1980s which were used by station owners before Congress or the Federal Communications Commission (FCC) even thought of them.

Drive to consolidate

Harry Cole, partner in the law firm Bechtel & Cole Chartered, said that the failure of the bill this year may provide a "greater impetus for people in stand-alone situations to duopolize." Cole likened a stand-alone station to a local general store down the street from two Walmarts.

Peter Bowman, vice president of BIA Consulting, said "the fear of being the last

one standing when the music stops, has led to a lot of in-market combining in anticipation of the telecom bill going through."

According to Bowman, "Much of the

Pittsburgh said he is familiar with several people who were counting on the deregulation to make everything all right.

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Monumental legal and regulatory decisions were recently made and debated in the nation's capital.

trading activity in 1995 has been motivated by the drive to consolidate, which has been made possible by the spectre of a further lifting of the ownership and cross-ownership limits."

Media broker Ray Rosenblum from

Proponents Oppose Auction

WASHINGTON For the satellite digital audio radio services (DARS) proponents, the quest for spectrum might seem similar to playing a board game with someone who makes up rules as they go along.

Last month, Reed Hundt, chairman of the Federal Communications Commission (FCC) repeated his belief that the DARS spectrum will be auctioned.

"My guess is that there will end up being a DARS auction," he said in an informal press meeting.

None of the four proponents who have met all the regulatory deadlines to offer CD-quality satellite broadcast stations were surprised even though the initial thought was for them to share the 50 MHz of S-band spectrum allocated for the service.

Auction action

Hundt likes auctions. Witness the three scheduled for this fall. They bring in a lot of money and make Hundt look good. Plus an auction of the S-band spectrum could have the added benefit of pleasing the National Association of Broadcasters (NAB) who say DARS is a threat to terrestrial broadcasters.

"If they auction it off, chances are nobody will ever build one," said proponent Clifford Burnstein, owner of Primosphere. "This is the dream of the NAB." Although the NAB has never said it favors auctioning the S-band, it does support opening the spectrum to more participants.

What meets with applause from broadcasters, however, could meet with lawsuits from DARS proponents anxious to start making money with satellite radio. Burnstein said his company will go to court if the FCC decides to auction the spectrum.

"It is not like it is a surprise that he would express perhaps a desire, but I think that it is difficult to do given that the four applicants have agreed that they can share the spectrum," said Lon Levin, vice president of American Mobile Radio Corp.

"We are more than happy to work it through among the four of us,"

continued on page 3 ▶

5-0 Vote for CBS Buyout

WASHINGTON Michael Jordan, chairman and CEO of Westinghouse Electric Corp. had a good Thanksgiving this year.

One day before the holiday, the Federal Communications Commission unanimously blessed the union of Westinghouse and CBS with all the necessary waivers.

Westinghouse now owns 39 stations in major markets. The FCC granted the company a temporary waiver for one FM station that exceeds the 20 AM/20 FM limit. The group's television stations will reach approximately 33 percent of the nation. Without the waivers, that is eight percent more than is currently allowed.

CBS shareholders overwhelmingly voted to approve the acquisition the week before the FCC met. Jordan announced that the group formed by the merger of Group W and CBS will be called CBS. "The CBS name and the Eye — its incomparable logo — will define our identity and future in broadcasting," he said.

The value of the historic transaction is approximately \$5.4 billion. That made Thanksgiving even better for CBS Chairman and CEO Laurence Tisch.



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World Radio History

NEWSWATCH

SFX to Acquire Liberty

NEW YORK SFX Broadcasting Inc. announced last month that it would acquire all of the outstanding capital stock of privately-owned Liberty Broadcasting Inc. for \$223.2 million.

Liberty Broadcasting has 19 radio stations in six markets. At the close of the deal, SFX will transfer 11 stations to Multi-Market Radio Inc. for \$100.1 million.

The eight stations SFX will keep include WXTR(FM), WXVR(FM), and WQSI(AM) in Washington; WHFS(FM) serving Baltimore and Washington; and WBAB(FM), WHFM(FM), WBLI(FM)

and WGBB(AM) serving Long Island, N.Y..

Multi-Market will walk away with WMBB(FM) in Richmond, Va.; WHCN (FM), WMRQ(FM) and WPOP-AM in Hartford, Conn.; WSNE(FM), WHJY (FM), and WHJJ-AM in Providence, R.I.; and WGNA(FM), WPYX (FM), WGNA-AM and WTRY-AM in Albany, N.Y.

Teleconference Held

MADISON, Wis. It was a cold November night in Madison when Chapter 24 of the Society of Broadcast Engineers (SBE) teleconferenced a seminar discussing the switch from the

Emergency Broadcast System (EBS) to the Emergency Alert System (EAS).

Gary Timms and Leonard Charles hosted the hour-and-a-half seminar. They also covered for Frank Lucia, acting chief EAS for the Federal Communications Commission (FCC) who could not come thanks to the government shutdown. Sources said Lucia had considered paying his own way to the conference, but the idea was scrapped by FCC lawyers.

According to the SBE headquarters, several hundred members joined the conference via satellite from 45 chapters. More are expected to see it on videotape.

FCC Takes the Week Off

WASHINGTON The FCC reopened for business Nov. 20 after 2,000 workers

spent four days at home while the president and Congress tried to work out their budget differences.

Only 95 FCC workers remained on the job either manning the monitoring stations at 13 field offices or supporting the international conference going on in Geneva. The five commissioners were exempt.

But nothing was certain at press time. The Continuing Resolution approved on Nov. 19 only funded the government through Dec. 15.

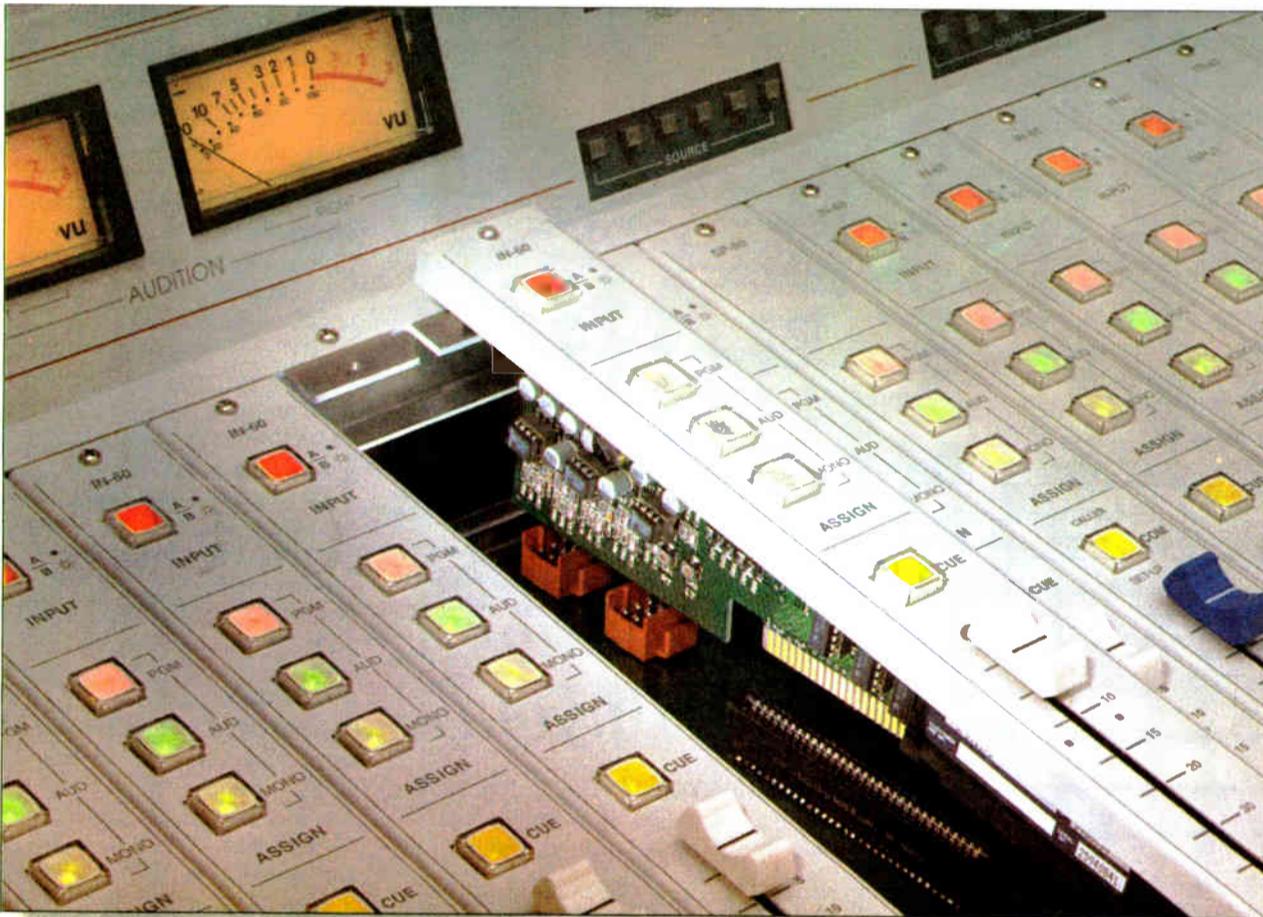
AWRT Awards

MCLEAN, Va. You have to move fast if you want to enter the 21st annual Commendation Awards sponsored by the Foundation of American Women in Radio and Television (AWRT).

The awards spotlight entertainment, news, features, and advertising programs that are creative and realistic in their treatment of women.

Entries must be postmarked by Dec. 20 and the winners will be honored in New York at an awards gala on April 1, 1996. To qualify, programs in radio, television, cable and advertising must have aired first between Dec. 1, 1994 and Nov. 30, 1995. Call 703-506-3290 for an entry form.

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Hundt Interested in DARS Auction

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said Levin. "It could be first come, first served or first up, first served. It could be some kind of band segmentation agreement in the beginning. I don't know what the answer is, but I do know that it is certainly preferable to an auction."

"He is one of five people who have an opportunity to express their opinion," said William Caldwell, president of Digital Satellite Broadcasting Corp. (DSBC), of Hundt. "To that end, I'm not convinced yet that auction is the actual state of play."

Would DSBC participate in an auction if

it came to that? "Absolutely," said Caldwell. "We have waited since 1992 to be able to provide this service."

David Margolese is chairman and CEO of Satellite CD Radio. In September, the FCC granted CD Radio a waiver to invest \$10 million in a satellite. Satellite CD Radio was the first to propose DARS in 1990.

"We really do not think that the commission is going to ignore five and a half years' worth of effort and expense. I just don't see the commission sweeping that aside and ignoring this company's definitive role in literally creating satellite

DARS in the United States," said Margolese.

Margolese said he thought 12.5 MHz would be about the break-even point for DARS proponents as far as return on their investments. He said that people will have "some awful good reasons" to buy new radios and subscribe to the new services.

Despite the uncertainty, three of the proponents said they were moving forward to varying degrees with their DARS plans. DSBC has not made any commitments with anybody yet according to Caldwell. "We are in the talking stage

with everybody," he said.

Satellite CD Radio has contracted with Loral to build two satellites and a spare although the \$10 million waiver probably will not cover even one-tenth of the cost.

Levin said American Mobile Radio is studying ways to get into the business as quickly as possible. He said the company is considering building an add-on package to a bigger satellite.

Primosphere is in a "waiting mode" Burnstein said.

"Why would I move ahead without a license? I may be dumb to the point where I've invested all this money in this thing so far based on the government's assurance that what I was doing was by the rules. I may be dumb to have done that, but I'm not even dumber to start to spend significant money to build a satellite when Reed Hundt is having informal get togethers saying he thinks it is going to be auctioned off," Burnstein said.

The four DARS proponents feel they deserve a "pioneer's preference" since they met the 1992 deadline for filing their satellite DARS applications. The NAB opposes that idea and has asked the commission to "maximize the participation of as many parties as possible in the satellite DARS licensing process."

In its reply comments on the Notice of Proposed Rulemaking, the NAB wrote, "Whatever resources the present applicants have spent are grossly disproportionate to the enormous spectrum windfall the commission would bestow upon them by guaranteeing them special spectrum allocations."

Owners Watch, Wait

► continued from page 1

BIA Consulting reported that eighteen group owners are either at or over the current 20 FM/20 AM limit. According to BIA, these include some of the top buyers of 1995 like Group W Radio, Evergreen Media, Chancellor Broadcasting, and Walt Disney Co.

But Steding and Bowman both said that the FCC is likely to grant any necessary waivers.

Bowman added, "We also believe the FCC will act unilaterally to promulgate regulations that will raise current ownership caps and permit greater ownership within markets."

to permit greater merger activity, many investors will be spooked by the prospect of actually having to put the deregulatory genie back in the bottle," Bowman said. He said BIA expected many new issuances to be postponed until the government clarifies the ownership issue.

Rosenblum said he doubted that the bill would become a law this year. He said the leadership in Congress has a different set of priorities right now including the well-publicized budget battle.

"Congress wants to go home," Rosenblum said. With Clinton ready to veto the bill, it was unlikely to get much farther this year. Rosenblum was not optimistic about passage in an election year, either.

Asked who would be happy about the bill dying a slow death, Rosenblum mentioned small town stations. Half of the radio stations in the United States are in small towns, said Rosenblum, and those stations have "an interest in the status quo."

He added that the president will probably try to make political points by vetoing the bill once it gets through Congress. And Cole pointed out that ownership deregulation "was really a small potatoes

part of the bill compared to telephone and cable."

Capital gains

"It's a little ho-hum at our end of the world," Steding said of the telecommunications bill. He said to look for passage of the capital gains tax cut as an issue that will affect the industry.

Ideal conditions might occur if the ownership caps are lifted and the capital gains tax cut passes next year. Group owners no longer held back by caps would find a blitz of owners eager to get out of the business and delighted to be able to keep more of their gain.

According to Steding, whether Congress lifts the limits or does not, "It's easy to figure out solutions in spite of what Congress does or does not get done."

Stock slip

The non-passage of the telecommunications bill could impact the public equity markets for broadcasting, said Bowman. According to Bowman, the radio stocks "more than doubled the growth rate of the Dow Jones Average and the Standard & Poors 500 Index."

Part of the increase in value was attributable to the expected regulatory relief and efficiencies allowed by consolidation said Bowman.

"Without the green light from Congress

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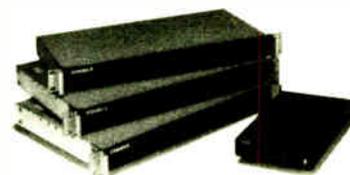
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Radio Passes Another Milestone

WASHINGTON The struggle to deal with change is a constant in anyone's personal and professional life. As an industry, change is more subtle and moves slowly. But if you step back and look carefully, you can pick out the milestones on the road of progress.

The merger mania of the second half of 1995 really gives me reason to pause. In particular, the purchase of CBS by Group W. Wow. Two long-time broadcast giants now are under one marquis. I think that is the part that set me thinking.

In a rather surprising (to me, anyway) move, Group W is doing away with the Group W Radio signature and retaining the CBS Radio name for the entire radio group. That news just blew me away. Of course, the CBS Radio name has a rich and distinguished legacy. Its reputation will do well for the new combined radio group's name.

I kept wondering, though, why Group W Radio did not win the coin toss after

firsts and excellence.

And you know ... what I think we just witnessed is a milestone in radio history. The era of engineering radio as we know it is closed; we're a part of a new age where development is more application than hardware. Think about it. Westinghouse is synonymous with transmitter and receiver manufacturing,

technology patents, black and white images of wireless wonder.

Technology is now so advanced (we, as a consumer don't see it) we don't want or need to see it. If we can sit at our computers and listen to stations from all over the world via the Internet; if we can pull digital quality radio off our cable channel or satellite dish; if all we have to worry about is whether the programming is good or not, then science and technology have done their jobs. The rest is up to the creative types.

Consciously or subconsciously, Westinghouse chose to go with the image that stands for programming excellence, the "Tiffany" network if you will ... the program image.

And so, Group W Radio moniker takes its place in the annals of broadcast history. Sure, the same people will be there and the same stations, etc. But it's a whole new ballgame.

And change will be tough for the individuals involved in the creation of the merged CBS Radio Station Group. Former Group W Radio President Dan Mason assumes the presidency of the combined group.

Unclear at this time is what former CBS Radio President Nancy Widmann's role will be. As someone who has reported on this business for 10 years, I would like to point out that Widmann is truly one of radio's great professionals.

Her long tenure at CBS is paved with success stories and respect for her many

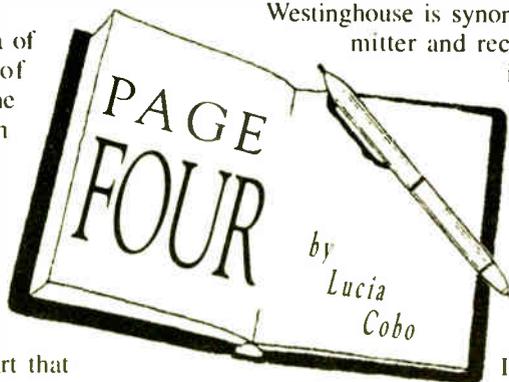
accomplishments. She is equally well-regarded by her colleagues in the business. (NAB recently gave her the its Radio Award for Lifetime Achievement.) I, for one, will eagerly await the news of what she will be tackling next, professionally. This business needs more professionals like her.

★ ★ ★

This really is a neat city to be in or around (even though I sometimes am

host blowout will be the National Association of Radio Talk Show Hosts (NARTSH) convention in June of next year (also here in Washington). Election campaigns should be in full swing by then, noted Distler, so it should be quite the gathering.

Technology is truly wonderful, isn't it? Lynn told me that the two stations in North Carolina I was raving about a few columns ago (WNHW Nags Head and WYND Hatteras Island) are sending their audio on Comrex DX200 ISO/MPEG Layer II digital audio codecs over a pair of 56 kilobits per second



all, it boasts many fine accomplishments and history (not the least of which is putting the first federally regulated broadcast station on the air: KDKA Pittsburgh of course, on Nov. 2, 1920). It has a long tradition of engineering



Washington hosted the Democratic Leadership Council Convention where NARTSH Executive Vice President Carol Nashe (l), Comrex Vice President of Marketing Lynn Distler and Talk America Engineer Carl Abrams (r) kept radio in the forefront.

taken to task by readers who feel that we're located too close to the hot air of Washington's political powers that be.)

But the proximity has its positives too. Case in point the recent gathering of the Democratic Leadership Council (see page 8). Comrex's Lynn Distler tells me that the second day of the broadcasts from the D.C. Convention Center went as smoothly as the first. In fact, she said that Lisa Davis, the press secretary for the DLC, said that she will not be allowed to do the conference without the radio hosts in the future.

Everyone is qualifying the event as an all-around success. The next big talk

(kbps) dedicated digital lines.

In fact, although most of the programming comes from WNHW, WYND produces local weather, news and commercials, which it feeds back to WNHW on the codec return path.

That's it for now.








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Community broadcasting

Dear RW,

Bill Dougan, of unlicensed radio station KAFR, had some interesting and valid points in his letter printed in the Oct. 4 issue of RW. However, I could not help but notice he took every chance available (and then some) to take potshots at one of the largest segments of the broadcast industry, Christian Radio.

Mr. Dougan's belief that those of us who use our radio stations for this type of work should be relegated to the expanded AM band is appalling at the least, extremely hypocritical if nothing else. He cites an untrue figure of 0.0 ratings for religious broadcasters (one that I am sure stations such as KLTU-FM Dallas and WFRN-FM South Bend would take issue with), and then goes on to say that moving us to the expanded band would not cause us any financial difficulty or audience loss.

I happen to be an avid proponent of unlicensed community broadcasting myself, but that is about all I share in common with Mr. Dougan it seems. It is simply ridiculous to assert that our 0.0 rated stations are somehow less important or less useful to the community than his 0.0 rated station. Brings to mind something about stones and glass houses ...

But wait! Christian broadcasting is not the only sector of radio on the receiving end of Mr. Dougan's wrath. He would like to do away with all major market translators. Gee, Mr. Dougan, I thought "community broadcasters" such as yourself believed in diversity and a wealth of choices for the radio listener. I do. Low-power radio is one of those choices, big-bucks mega-power radio is another, while Christian radio is yet another. We all have our roles and purposes, we all contribute something valuable to our locales, and contrary to what you might believe, low-power radio (which is, much to my dismay as well, essentially illegal) does not

have a corner on the market of being community-oriented.

As a community broadcasting believer, I agree that radio is not all ratings and money. But these are the exact reasons Mr. Dougan gives in his ironic suggestion that Christian radio be banished to what he himself calls the wasteland of expanded band AM (I have nothing against expanded band AM, but I digress).

With such foolish ideas coming forth from one of the more vocal advocates of community radio, is it any wonder others of us who also advocate such a service are not given the attention we deserve? Do us all a favor, Mr. Dougan: work for community radio without trying to tear down others who also wish to express themselves — a right guaranteed all of us by that First Amendment that you claim protects your rights.

Ronald C. Schoedel, III
Program Director, WJYM-AM 730
Toledo, OH

Ham radio

Dear RW,

Webster's New Collegiate Dictionary defines a hobby as "a pursuit outside one's regular occupation engaged in for relaxation."

In support of Paul Courson's comments and contrary to Abelardo Massa's comments, amateur radio can be a hobby and has been mine for 34 years. My hobby led to a career in broadcast engineering which is my occupation. I suspect a survey of licensed amateur radio operators would show a low percentage honestly focusing on the service aspect of this hobby.

Job applicants at broadcast stations with which I am associated who have an amateur radio license will go to the top of the list of prospective candidates being considered.

One further observation is that good role models, particularly in broadcast engineering, are few and far between in this day of de-regulation in AM-FM broadcast stations. Amateur radio presents an excellent opportunity to polish technical skills and is only limited by your own desire for self improvement. I would recommend this fine hobby to anyone interested in a future career in the communications field or in need of a relaxing diversion at the end of a work day.

R. Dean Sever, W8IM
Leesburg, FL

Little stations

Dear RW,

It must have been just past Labor Day 1981 when my wife and I were headed north in an ailing Datsun hatchback filled with second-hand broadcast gear. Also in the car was a sheet of paper authorizing us to build a tiny commercial FM station on the shore of Lake Champlain. Along the way we rumbled our over-stuffed vehicle into a Gloucester, Mass., parking space and walked up flights of unkempt stairs to seek out Simon Geller.

A recent Readers Forum contributor mentioned Mr. Geller's passing, trigger-

What's In a Name

The early days of broadcasting were populated by brilliant technical minds that invented magic music boxes. Names like Frank Conrad, Lee de Forest, Edwin Armstrong and George Westinghouse all resonate with scientific and technological wonder.

Westinghouse, the company, has for 75 years stood for broadcast excellence. Group W Radio has powered up some of the legendary stations in

this country: KDKA Pittsburgh, KYW Philadelphia (originally launched in Chicago), WBZ Boston and WJZ Newark - to name but a few. As of last month, Group W Broadcasting swallowed CBS whole. The combined merger of the radio groups, now known as the CBS Radio Station Group, is the highest billing radio group with 39 stations in 13 markets.

This newest force in radio will march forward bearing the CBS name. The Group W Radio name becomes part of this industry's history. It is a moment worth noting.

As telecommunications law and regulation become deregulated, as rules are relaxed and technology advances to permit new and innovative ways to program efficiently and effectively, more and more of those familiar radio names are sure to follow Group W Radio into the history books.

Seventy-five years into its history, radio is poised to enter the digital era. An era that will require brilliant, creative minds that can help the medium compete in a multimedia world. It is an era that Group W and CBS helped usher in partnership with Gannett Broadcasting and their combined efforts on Project Acorn/USA Digital Radio.

The combined energy, resources and radio know-how of CBS and Group W Radio bodes well for the company's success in the future. Radio is, after all, about passion for your work and a continued striving for excellence in programming. Separately, these companies have been industry leaders. Combined they should be formidable.

Good-bye Group W Radio. What's in a name, after all?

— RW

ing my memory of that pilgrimage to his one-person station, WVCA(FM). I recall seeing this gruff-looking fellow playing taped (7.5-inch Shamrock boxes) classical music through a little four-channel Sparta board, into a quasi-dismantled transmitter next to his bed, and up to a few vintage antenna bays via a length of transmission line fed out the window. My wife recoiled at his broad-gestured warnings about how tough broadcasting had become for the little guy. After rushing back to the makeshift studio, he left us standing near the door thinking for a moment we had chosen the wrong field. A while later, we gently closed Geller's door and left through a hollow-sounding hallway.

"Just a minute, young people," someone called. "When anybody tries to stop you from realizing your dream of being a real broadcaster keep going anyway. After all," Mr. Geller said, "those individual dreams are what gave America the greatest radio landscape in the world."

We went to build our station, then bought another one for a dollar from some folks who had given up. Of course, there were a few days when local station ownership seemed to lack its rewards. It was on those occasions, however, that I could hear the words of Simon Geller, the grumpy-sounding man who happily added his beaten-up transmitter to radio's variety, stressing the importance of little stations and big dreams.

Peter Hunn, Assoc. Professor
Dept. of Communication Studies, SUNY
Oswego, NY

Incarceration?

Dear RW,

Two (count 'em) two kudos for Parts 1 and 2 of Ty Ford's treatise on copy and production. I can hardly wait for Part 3

and beyond.

Too many stations allow their listeners to be announced at, rather than communicated with and talked to. Why, then, are they surprised when their advertisers offer no delighted testimonials nor schedule renewals?

Avoiding clichés like the plague is only the beginning. While we're at it, let's send to prison all copywriters who still insist on using the adjective "incredible" in every spot. Instead of stamping our license plates, perhaps they could work in the library.

Norm Hankoff
Citrus Heights, CA

Funding the FCC

Dear RW,

What is the most equitable way to fund the FCC? By charging hefty annual fees to tiny radio stations in the middle of nowhere?

How about a sales tax when stations change ownership? A two percent sales tax would provide the FCC with millions of dollars in revenues, and the cash would come from those who are most able to pay. Anyone who can afford \$50 million for a major market TV station should not mind paying \$1 million for the transaction privilege. A sales tax might also have a chilling effect on station trafficking which is probably not in the public interest.

Still another big revenue raiser would be to auction off new channels to the highest qualified bidder. Under the present system of competitive hearings, lawyers and members of minority groups get rich and the station ultimately gets sold to the highest bidder a year later. Omit the hearings and minority preferences and give the cash to the FCC instead.

Paul S. Lotsof
Manager, KAVV (FM)
Benson, AZ

Radio World

Vol. 19, No. 25 December 13, 1995

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Radio World (ISSN: 0274-8541) is published bi-weekly by Industrial Marketing Advisory Services, Inc., 5827 Columbia Pike, Suite 310, Falls Church, VA 22041. Phone: 703-998-7600, Fax: 703-998-2966. Second-class postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send 3579 forms and address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Christopher Rucas, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966. Copyright 1995 by Industrial Marketing Advisory Services, Inc. All rights reserved.

—PRINTED IN THE USA—

Next Issue of
Radio World
December 27, 1995

Shure Legacy Will Live on in Mics

by Frank Beacham

CHICAGO S.N. Shure, an audio pioneer whose products became classics in radio broadcasting, died Oct. 17 at the age of 93.

Legendary radio broadcast products such as the M67 microphone mixer, SM5B microphone and the M44 phono cartridge were developed and manufactured by Shure Brothers Inc., the company founded by Shure and his late brother, S.J. Shure, in 1928.

"Mr. Shure has been the guiding light of this company for over 70 years," said Shure Brothers president James H. Kogen. "His loss will be felt most profoundly by all who worked with him."

Born in Chicago in 1902, Shure became an early amateur radio

hobbyist who worked in a radio factory. In 1925, he started the Shure Radio Company, a wholesale parts supplier for home radio set builders who were just beginning to experiment with the new "wireless" technology.

Operating alone from a tiny office he rented for five dollars a month, Shure published his first radio parts catalog within his first year of operation. The resulting orders helped establish the Shure name worldwide. In 1928, the company was renamed to reflect the brief period when the Shure brothers were business partners.

The first Shure microphone — a two-button carbon model — was produced in 1932. The microphone was significantly better than previous designs in virtually every way: more compact, better sounding, more efficient and less expensive. Next came the industry's first modern noise-canceling microphone and then the

first controlled magnetic model.

In 1939, Shure invented the legendary Unidyne, the world's first single-element directional microphone. The Unidyne breakthrough reduced the complexity and expense of unidirectional microphones and remains today as one of the single most important advancements in the history of microphone development.

During this period, Shure was also a highly successful manufacturer of phonograph cartridges. Every major phonograph maker — Philco, RCA, Emerson, Magnavox, Admiral and Motorola — turned to Shure for their cartridges.

After the outbreak of World War II, Shure led his company to make a new generation of highly durable and

reliable microphones for war use. A company slogan during this increased manufacturing period was: "Microphones are weapons of war."

Following the war, when many manufacturers looked forward to more relaxed peace-time manufacturing standards, S.N. Shure made a crucial business decision. He decided that his company would continue to build all of its products to "MILSPEC" or military specifications. Thereafter, the company earned a reputation for rugged products that remains to this day.

In the 1960s, Shure introduced the end-firing single-element unidirectional microphone (SM57) and refined it further with a round, integral pop filter (SM58). This family of microphones became the standard for live-performance microphones through the 1960s and '70s. Also in this period, Shure introduced the M67 microphone mixer, a product that was to

become a broadcast industry legend.

Shure earned a bachelor's degree in geography from the University of Chicago.

An internationally known figure in the field of philately, Shure's passion for stamp collecting brought him a fellowship in the Royal Philatelic Society, membership in the Chicago Philatelic Society and New York Collectors Club, and his founding of the Israel Palestine Philatelic Society. A portion of his extensive collection was donated to the Smithsonian Institution.

"He was a perfectionist in both his personal and business life," said Howie

Harwood, a former Shure advertising and public relations director who joined the company just after World War II. "This philosophy extended through the company. It was recognized we'd never reach perfection but had an obligation to strive for it."

In the early days, Harwood said, Shure personally visited radio stations to seek out information about potential products and to meet his customers.

"He was extremely hands on," said Harwood. "He used to personally approve every ad, catalog, bulletin and flyer. Usually he'd leave work with two small suitcases full of materials to take home."

"His greatest contribution was motivating the people working for him and that began with the research and development end of the company." 



S.N. Shure

Eureka Fights Odds for Inroad to U.S. Market

by Lynn Meadows

SYRACUSE, N.Y. Pretend Eureka-147 is chosen as the digital audio broadcasting (DAB) standard in the United States. The first roadblock Eureka will face in the United States is how it should be implemented.

Given the challenge the Electronic Industries Association (EIA) had just getting L-band space to test Eureka, it is incomprehensible that the L-band could be used domestically for digital radio.

Last month, when RW asked Clint Pinkham, manager of technology applications at Thomson Consumer Electronics, how Eureka could be adapted for use in the United States, he mentioned that the system could function effectively using taboo TV channels in the low VHF band.

Technically possible

TV channels are taboo if using them interferes with another channel; either an adjacent channel spills onto it or the same channel may be used in a nearby city.

Lynn Claudy, senior vice president, science

& technology at the National Association of Broadcasters (NAB) agreed that technically, Eureka could work well on taboo TV channels.

"Certainly it is technically possible," said Claudy. "Because it is technically possible doesn't mean that it is practically feasible." Claudy added.

The VHF band is 6 MHz wide. Eureka uses blocks that are 1.5 MHz and hold up to five channels. Using Eureka in two or three channels could cover an entire market said Pinkham. He added that the digital audio signal would not interfere with standard TV channels.

Squatters

"Being a television guy, I wouldn't like some other interloper besides the ones that are already hanging around trying to snatch the frequencies," said one industry observer of the Eureka idea.

Indeed, Eureka will have to stand in line to use the taboo channels. The Federal Communications Commission (FCC) is trying to decide how to encourage the switch to high definition television (HDTV).

Under one plan, television stations would be given another channel on which to digitally simulcast their normal station. With nearly 1600 television stations needing another channel, the taboo channels would quickly be eaten up.

With or without HDTV, the capability to digitally compress data has other television broadcasters eyeing the taboo channels and thinking up ways to cram multiple television stations on one frequency.

Practically speaking

Claudy returned to what the NAB has been saying since it rejected Eureka in 1991.

"Eureka requires that different broadcasters share the same transmitter, share the same antenna, have a single point of failure," he said.

He added that all stations on a single transmitter would have exactly the same service area because they would all be multiplexed in the same transmission.

"The technical problems of implementing Eureka here, we believe, are not very big compared to the problems of convincing the radio industry that they want to do business that way and transmit as a group instead of as individual entities."

But Pinkham offered the taboo channels as only one solution. The flexible Eureka may yet find an uncharted and unknown bit of spectrum to call its own. 

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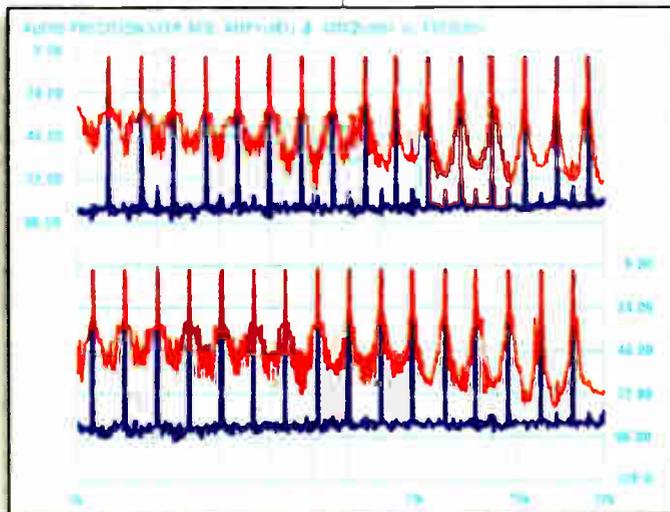
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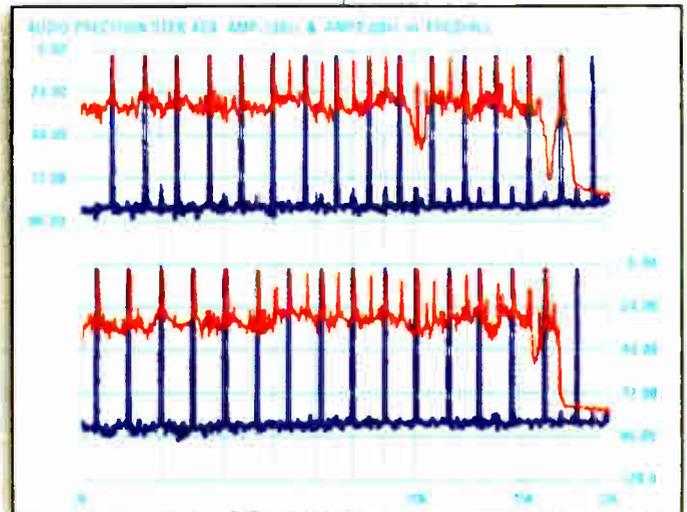
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The stereo test signal (blue) consists of tones that are offset on each channel. Layer III keeps the left and right channel information separate, maintaining the integrity of the stereo signal. Since perception of stereo is in the higher frequencies, Zephyr yields improved stereo perception.



Above about 6kHz, the CDQPrima combines the left and right channels. For example, note that the 10kHz signal applied only to the left input appears on both the left and right outputs. The stereo image suffers.

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information is most critical. That's why Zephyr's Layer III coding is best for ISDN transmission of remotes, commercials, and other full-fidelity, stereo material.



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Circle (209) On Reader Service Card

ISDN Provides Snag Free Coverage

by Lucia Cobo

WASHINGTON Politics may make strange bedfellows, but politicians and radio talkers are right at home together.

Sixteen of radio's brightest talk show personalities broadcast live from the nation's capital, during the annual Democratic Leadership Council (DLC) convention, courtesy of Comrex Corp., its Codec Buddy and the Talk America Radio Network. The DLC hosted 1,500 up-and-coming Democratic leaders as well as scores of radio listeners Nov. 13-14.

The idea came from the DLC, according to National Association of Radio Talk Show Hosts (NARTSH) Executive Vice President, Carol Nashe. Nashe, together with Talk America's Tom Star and Comrex's Lynn Distler arranged for the daylong broadcasts to happen. The two-day broadcasts began at 5 a.m. and ran through 7 p.m.

Talk America's Tom Star decided to donate the network's services. The idea, he said, was to have one engineer who was well-versed in using the ISDN equipment, handle all the setup

and broadcast questions. The broadcasts went smoothly.

Talk America's Carl Abrams set up three of the four on-air tables with ISDN lines from Bell Atlantic — the fourth table was set up with a two-line frequency extender — Codec Buddies from Comrex and AT4050/CM5 multipattern capacitor microphones and headphones from Audio-Technica.

"It has been the first remote in eight years that went off without one single thing going wrong," said Nashe.

All involved gave Bell Atlantic

high praise for its service.

"Absolutely perfect," according to Abrams. "ISDN provides them (the talk show hosts) a long mic cord with the callers — they really can be wherever they want to be."

Abrams set up lines direct from all the session room podiums to the Codec Buddies — allowing the various hosts to go live with session coverage or with keynote speeches (such as President Clinton's on Nov. 13).

The broadcast tables were set up outside the main conference

room area, allowing the radio hosts to snag political leaders as they exited the sessions. According to Nashe, the on-air guests would just move down the line from one broadcast table and show to the next.

"The synergy between talk show hosts and politicians was great," said Distler.

Included in the roster of on-air stars were: KVI Seattle's Mike Seigel; WBDN Tampa, Fla.'s T.J. Walker; WSYR Syracuse, N.Y.'s George Kilpatrick Jr.; KSDO San Diego, Calif.'s Roger Hedgecock; WWDB Philadelphia's Dom Giordano; Blanquita Cullum; Salem Radio Network's Armstrong Williams; Talker's magazine Michael Harrison; Talk Radio News Service's Mike Sponder, Ellen Ratner; and Talk America Radio Network's Aaron Harber, Derrick DeSilva Jr., Mike Foudy, Judy Jarvis, Hugh Rodham and Doug Stephan.

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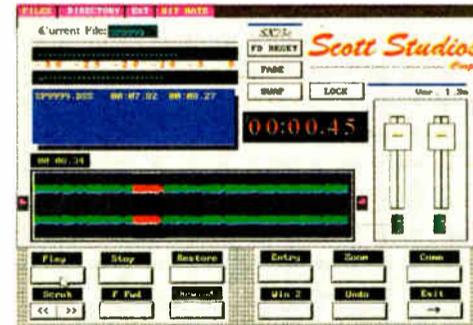
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Arbitron Appoints Haaf

by Lynn Meadows

NEW YORK After seven markets balked at Arbitron's sampling in their markets this fall, the company announced it was appointing Norm Haaf to the newly created position of director, data collection.

The move is a direct response to the snafu that caused Arbitron to cancel the Phase One report in Fresno, Calif. Other markets less than pleased with their reports included Buffalo, N.Y.; Dallas; Albuquerque, N.M.; and Milwaukee.

"The events of the fall survey demonstrated that we need one person accountable for the quality of our data collection process," said David Lapovsky, vice president, research and operations.

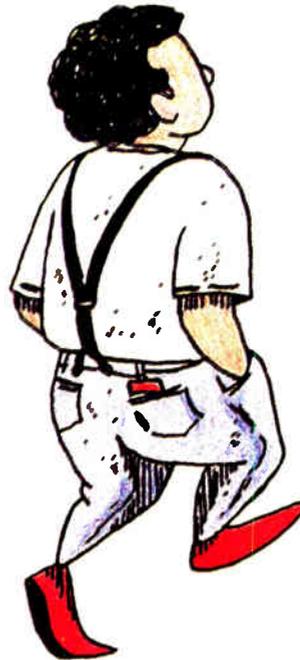
Haaf will oversee survey sampling, interviewing, and mailing and report to Lapovsky. Haaf has worked at Arbitron for 22 years. He ran the television meter field operation from 1984 to 1993. That operation maintained a panel of 20,000 household and people meters in 20 markets. More recently, Haaf was director, operations for Arbitron NewMedia.

Lapovsky said he could not promise that Arbitron will not make mistakes.

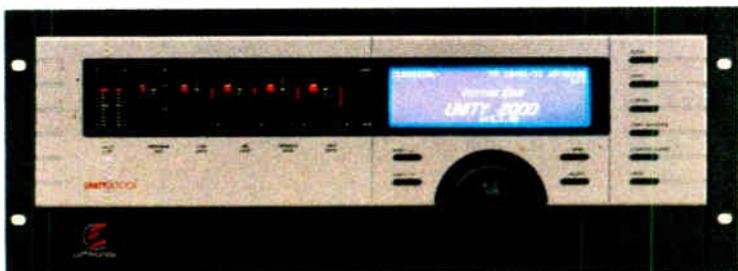
"If we do make a mistake," he said, "we will tell you about it. We will not put any data on the street that is not reliable and credible."

The consolidation of data collection under Haaf complements the consolidation of data processing early this year under Brad Feldhaus, now director of information processing. Since that move, the number of reissues has dropped from 13 to three.

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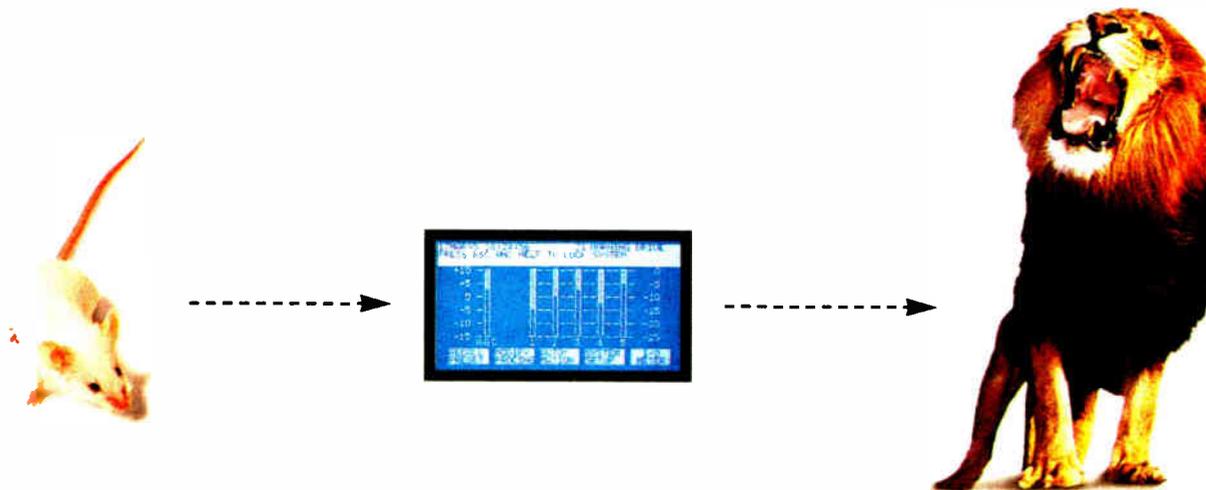
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St. Louis and KSD Welcome the Rams

by Lynn Meadows

ST. LOUIS The Cardinals may have flown the coop, but the Rams have taken residence in St. Louis and, at press time, were still ahead albeit marginally with a 6-5 record.

With one month until the first kickoff, Chief Engineer Marc Lehmutz learned that KSD-AM-FM, owned by EZ Communications, had won the contract to broadcast all the games of the St. Louis Rams. But neither station had the equipment necessary to cover the new home team. KSD-AM-FM contracted with Bud Sports to help coordinate the broadcasts.

That started a frenzy of orders which were pretty much filled by the time of the coin toss at the Seattle Mariners stadium on Aug. 5.

"It was like Christmas," Lehmutz said of the equipment purchases for the game broadcasts.

Be prepared

The final two sets of parabolic dishes arrived by FedEx on game day to Lehmutz's Seattle hotel room. Had the dishes been late, Lehmutz was prepared to go on-air with the two he already had.

Lehmutz used the same "be prepared" policy with the ISDN lines used for the broadcasts. He made sure Comrex II lines were available as backups. That paid off quickly.

In Jacksonville, Oakland, and Indianapolis, the ISDN line buckled out for around 30 seconds. Lehmutz said the switch to Comrex and back was seamless over the air.

KSD is using the CCS Prima Series 120 and 230 for its ISDN Layer II feeds. Lehmutz liked the bidirectional 15 kHz stereo. The station is part of the Midcom NFL/ISDN Co-op in which 11 teams share ISDN lines at 29 stadiums. Early in the season, Engineer Jim Jackson joked that the KSD crew always seemed to be the first ones to hook into the ISDN at the stadium and check it out. That required some extra setup time.

Although the games are simulcast, the delivery is tricky because the AM and FM stations use different spots. In addition, 30 other stations pick up the feed through a Learfield Communications uplink in Jefferson City, Mo. On game day, the production room turns into a network studio.

Elaborate system

Lehmutz and Jackson decided they wanted to have good field sound. To accomplish this, they purchased four parabolic dishes. The operators roam back and forth between the goal and the 30-yard line. For field sound, they are using frequency agile Sony WRT 820 UHF wireless mics.

Two field reporters carry Sennheiser MD431U condenser mics.

Lehmutz expects to have two-way communication with dish operators next year. That was one of the few corners that was cut this year. KSD uses Sony Walkmans dialed up to 87.5 FM to give instructions to the operators on the field.

The stadium studio has two consoles and four headsets.

"It is a pretty elaborate system," said Lehmutz. According to Jackson, the set up takes between four and five hours. For away games, they have four road cases

which carry over 500 pounds of equipment.

Bud Sports coordinates the shipping of the equipment said Jackson. He said the air freight packages are generally waiting for him when he arrives — which for a Sunday night game is usually Friday night.

Jackson keeps a list of things to fix and works on them at the hotel room or in the stadium. With so much of the equipment being practically brand new, maintenance is not a big issue, he said.

"It's fun but it is hectic," said Jackson. For a Sunday game, he generally puts in a 13 to 16 hour day.

In the booth, Jackson uses a Soundcraft 20 input mixer. Lehman said he has tried to run the board a few times and "there

is a lot to it." For one thing, in the stadium, the engineer does not hear the local spots being played and has to count seconds.

Best possible

Jackson also keeps a DAT tape master recording. During the game, he keeps several tapes running. When a touchdown or great play happens, he pulls the tape for quick access during the halftime or post game shows and replaces it with another one.

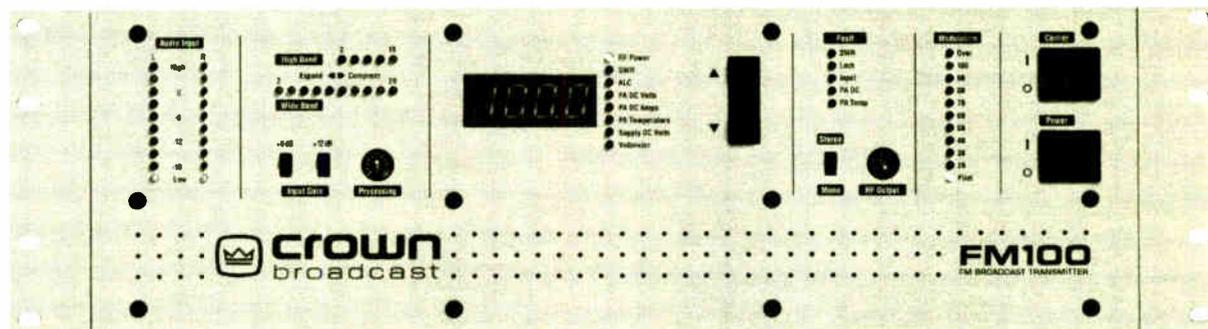
"We just decided we wanted it to sound the best possible," Lehmutz said. He said he is considering adding a delay to the station's broadcast to match the TV

delay. Right now a person listening to KSD and watching the game on TV will hear what the referee says before his lips move. Lehman said he wants the two mediums to match sound-wise.

In the middle of the season, the team began playing its games at the new Trans World Dome Stadium in St. Louis. The move went well according to Lehmutz who said the main change required was the installation of new ISDN lines.

Although the Rams were enjoying a winning record at press time, from all accounts, it is the game-day broadcast equipment setup that will be the hardest to beat.

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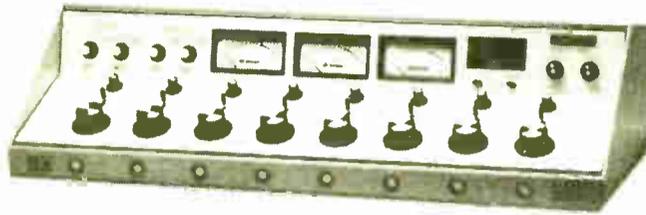
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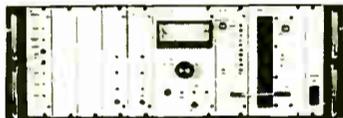
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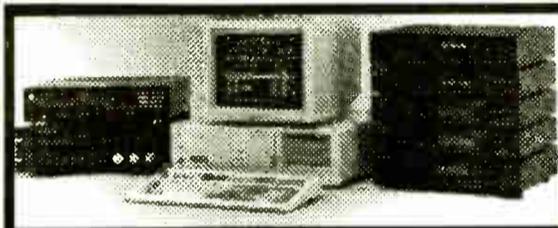
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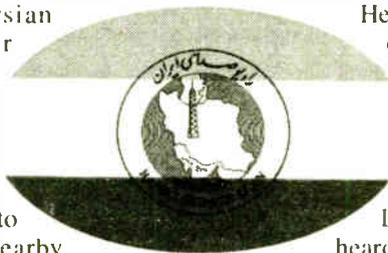
by Bob Rusk

LOS ANGELES The aroma of Persian cuisine fills the air on Westwood Boulevard, coming from restaurants not far from the campus of UCLA. There are neighborhood markets that stock Persian goods and shops that carry Farsi language books. This one-mile stretch of the boulevard is the heart of Southern California's Iranian community and has become their Main Street.

The 500,000 Iranians in the region also have a radio station to tune in for news and information: Radio Sedaye Iran (Radio Voice of Iran). RSI, which has been broadcasting since 1988, operates as a subcarrier of Pasadena Community College station KPCC-FM (89.3).

RSI is owned by the Persian Morovati family, whose other business interests include property development.

RSI operates from studios on trendy Wilshire Boulevard in Santa Monica. The signal is sent via phone link to Pasadena, then to KPCC's transmitter site atop nearby Mount Wilson.



the Iranian revolution in 1979, according to RSI consultant Kamel Helmi, PhD.

"We were fortunate from the beginning," he says. "They were names known to the people, so we started with a group of experts and had programs similar to what was heard in Iran. Now we cater to the Persian-Americans as well. It's a link with the past, particularly our culture."

The station has 35 employees, including free-lance producers. The RSI schedule includes "Good Morning Iran," a news program; "Morning Flowers," a literature-arts-sports show; and medical discussions on "You and Your Physician." Occasionally, interviews with English speaking newsmakers such as senators and doctors are broadcast, with translation into Farsi.

Helmi, who has worked with the Voice of America and the BBC, says about 40,000 receivers have been sold to families in Los Angeles alone, where each household averages four people.

Most of RSI's receivers are in Los Angeles, but the station is also heard in other California cities including Fresno, San Diego, and the San Francisco Bay area.

In addition, RSI leases FM subcarrier space on stations in Dallas, Houston, and San Antonio, Texas, as well as Washington, New York, Boston, Philadelphia, and Portland, Ore. The signal is transmitted to the affiliates via satellite.

"Hopefully we will soon be able to serve every member of the Iranian community," adds Helmi. "But we must have a minimum number of people in each city for it to be economically viable." Helmi estimates that in Portland, one of the cities with a small number of Iranians, there are only 500 receivers.

The cost of a receiver varies from city to city. "There is a base in Los Angeles," explains Helmi, "where the cost is \$35. In New York, the cost is \$100 because it is so expensive to lease a subcarrier."

"Radio demands a lot of cash flow," he continues. "It costs between \$500 - \$600 an hour to operate the station. The majority of revenue is generated by advertising, which is 60 - 90 days behind. The creation of cash flow is an art form, particularly for a station like ours that does not rely on subscriptions or government support."

Radio Sedaye Iran

Radio Sedaye Iran does not have national advertisers, so all spots are sold to local advertisers including restaurants, doctors, and accountants in the affiliated markets. In cities such as Portland, where there are no sponsors yet, the Los Angeles spots are heard.

A major concern for RSI is the future of subcarrier frequencies, which have traditionally been less expensive to operate than those on the main FM band. The radio industry is close to agreeing on a high speed data subcarrier standard, which would add competition to the marketplace.

"Unfortunately in areas where we want to establish stations, it would effect our cost," Helmi says. "We would have to compete with people who are ready to pay higher prices. It would be more difficult to run a tight ship."

"The only options are to continue on the subcarrier or move to satellite. Even if we wanted to move to satellite, we have sold about 65,000 receivers. We have to provide service for those receivers, so we cannot disconnect ourselves from the present system. In new locations (there are plans for outlets in Chicago, Atlanta, Miami, and Vancouver, Canada), we will look to see what is more economical: to lease space on a local station or to operate on satellite."

Regardless of which system is used, there is a demand for RSI's programs. About two million Iranians now live in the United States, all potential listeners for Radio Sedaye Iran. But RSI provides more than programming. They also repair receivers that occasionally malfunction.

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Around the clock

RSI is on 24-hours-a-day, with live programming in Farsi airing from 6:00 a.m. — midnight. Rebroadcasts run overnight. The station describes its format as "talk shows with strong listener participation. All avenues of life, from literature to politics are discussed with the objective of increasing listener awareness and promotion of understanding, (with) respect (for) the past and hope for betterment in the future."

Program hosts previously worked for Radio Tehran and came to the United States following

ESPN Wins NBA

by Alan R. Peterson

BRISTOL, Conn. ESPN Radio Network obtained exclusive radio broadcast rights to the National Basketball Association (NBA) — marking its entry into live sports event programming.

The agreement includes regular and post-season games as well as non-game programming.

Coverage is to begin Sunday, Jan. 21, 1996, with Orlando and Houston in a rematch of last season's NBA Finals. Broadcasts will include live coverage of 13 regular season Sunday afternoon games, all post-season and championship games, the All-Star Weekend and the NBA Draft.

The agreement is the first event programming for ESPN Radio, a joint venture between ESPN Inc., and ABC Radio Networks which premiered January 1992. ESPN Radio provides more than 2,100 hours of content annually on 355 stations.

Broadcasts originate from studios in ESPN's Bristol, Conn. headquarters. Programming now provided by ESPN Radio includes Sportbeat with Brent Musburger, Extra Point drivetime commentaries, GameDay: The NFL on ESPN Radio, weekend and big event programming and The Fabulous Sports Babe.

NBA Radio will be produced by ESPN Radio, with ABC Radio Networks handling sales, affiliate relations, marketing and promotion.

SEIKO Sets Sites for High-speed Standard

by Angela Novak

WASHINGTON Using unique microchip technology and a network of FM subcarriers, SEIKO Communications hopes to build its high-speed data broadcasting service, the FM Superhighway, into an industry standard.

The system uses high-speed FM subcarrier technology to transmit data, paging services and audio and graphic messages to receivers in car, home and portable radios as well as to computers, watches and other "intelligent" products.

The key component of the system is the Advanced Communications and

Timekeeping Technology (ACTT) chipset; a miniature data receiver with worldwide broadcasting capabilities.

"It's the best subcarrier system out there," said Mike Park, vice president of business development for SEIKO Communications.

He cited the compatibility, versatility and flexibility of the system as keys to its success.

"We designed the technology to be low cost and very accessible," said Park. SEIKO is currently focusing on network expansion worldwide and new and innovative products for the masses.

Future efforts to explore the potential applications of the ACTIVE System

will concentrate on the "transfer of technology to manufacturers of consumer products," said Park.

Compatibility

The system broadcasts information at 19,000 bits per second per subcarrier — 38,000 bits per second total and is designed to support four billion addresses. Flexible data transport is possible and provides 99.9 percent data reliability for datagrams.

The system operates on a 66.5 kHz FM subcarrier, occupying only 16 kHz at -70 dB. SEIKO notes that this allows ACTIVE to coexist peacefully with RBDS (Radio Broadcast Data Service) subcarriers.

In the ACTIVE II phase of the project, a second signal will be added as an 85.5 kHz subcarrier. This signal will not affect the 66.5 kHz ACTIVE I subcarrier or the 57 kHz RBDS subcarrier.

Fully compatible with U.S. and international broadcast standards, including RDS and RBDS, the system maintains a standard frequency allocation worldwide. ACTIVE System receivers function at any location.

This compatibility, and the flexibility it grants broadcasters, underlines SEIKO's determination to work with FM broadcasters to bring the ACTIVE System to consumers.

"The FM broadcaster is a key part to our success," said Park. The low cost and accessibility of the technology is based on the fact that the system operates within an existing worldwide broadcast infrastructure.

Building a network

The system offers broadcasters many services aimed at increasing revenue and listener base. Specific services include network frequency lists, program segment flags, station identification and location, dedicated emergency broadcast channel, format identification and differential global positioning service (GPS).

The transmission equipment is self-monitoring to protect broadcast equipment and services, ensuring negligible impact on FM radio itself.

The ACTIVE System uses multiple stations in a market to guarantee better and more consistent reception of the signal. Data is input from various sources and sent to the various FM stations by satellite or landline. The stations work together to form a network which provides a strong signal to receivers.

The receiver

This data network combined with unique receiver technology is what makes the SEIKO system special, said Park.

"The chips take care of everything and do the tuning for you," said Park. The data network system works with the receiver technology to provide a strong signal even if the receiver is in motion.

Designed by SEIKO, the system uses three chips: a bipolar scanning 2.1 V FM receiver, a CMOS demodulator/decoder, and a CMOS microcontroller.

The ACTT receiver provides a range of

services including personal messaging, data distribution, emergency messaging, e-mail and fax delivery. SEIKO describes the technology as frequency-agile, highly integrated, energy efficient, inexpensive, reliable and intelligent in a broadcast operating environment.

The system was first integrated into the SEIKO MessageWatch and is being tested in the U.S. and internationally. The Netherlands Broadcasting Transmission Co., NOZEMA, is conducting tests for European datacasting. France is also investigating the system and it was

France is also investigating the system and it was recently named an industry standard in Japan.

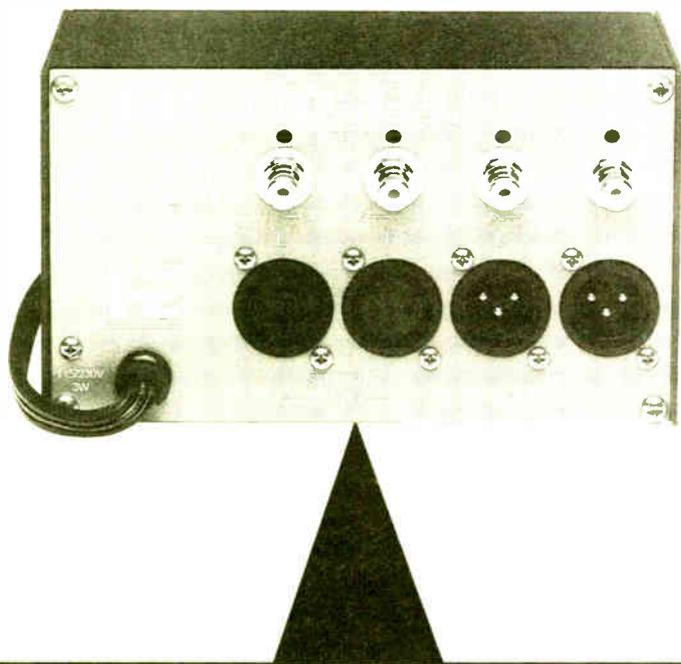
recently named an industry standard in Japan.

In the United States, the Seattle Wide-area Information For Travellers (S.W.I.F.T) project is testing the use of the system as a network to transmit travel information to commuters. A similar test is being held in Minnesota.

Marketing

Currently the MessageWatch sells for \$60 to \$100, said Parks. Receivers for car radios and hand-held computers are still in the testing stage and not yet available for retail sale.

SEIKO Communications plans to market the technology like any other commercial product, said Dianna Schmid, director of marketing and corporate communication for SEIKO. They plan to utilize commercial advertising and the trade industry to educate consumers and broadcasters about the benefits of the SEIKO system. 



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Fred Allen's
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page 20.

Hall of Fame Inducts Radio's Best

by Alan Haber

CHICAGO Seventy-five years of radio history filled the airwaves on Oct. 29, as the Radio Hall of Fame celebrated radio's birthday with a live broadcast of its 1995 induction ceremony.

The 75th anniversary of radio commemorates the Nov. 2, 1920, broadcast of the results of the Harding-Cox presidential election by KDKA in Pittsburgh.

The program was broadcast live via satellite on 70 stations along the Radio Hall of Fame Network in the United States and Canada and featured audio clips from famous broadcasts. Fred Foy, perhaps best known as the announcer for "The Lone Ranger," anchored the event.

In the beginning

"Good evening, Americans," said Paul Harvey as he opened the broadcast. "In the beginning, there was void. The earth was cloaked in day and dark and barren silence. And Guglielmo Marchese Marconi said 'Let there be music in the air, and voices and singing and preaching and praying and laughter in the air,' and so he created radio."

Harvey related radio's rich history to the audience, from the first broadcast on KDKA to Lowell Thomas's historic bulletin delivered on May 29, 1927, telling listeners that Charles A. Lindbergh had landed in Paris.

Inductee Stan Freberg, the man the trade publication Advertising Age called "the father of the funny commercial," was introduced by Chicago radio station WGN's Wally Phillips.

Freberg said he has been a fan of radio as long as he can remember.

Lifelong fan

"According to my mother," he said, "there was a radio dragged into the delivery room of the Californian Lutheran Hospital by a nurse who hated to miss the soap opera 'Young Doctor Malone.' I was born, then, on Aug. 7, between the NBC chimes and an Ivory Soap commercial, which makes me a Leo with Procter and Gamble as my rising sign."

An effective stage

Legendary producer and director Himan Brown, who created the famous "Inner Sanctum Mysteries" and the "CBS Radio Mystery Theater," introduced inductee Les Tremayne, who acted in such radio dramas as "The Romance of Helen Trent" and "One Man's Family."

"Of all the forms of theater," said Brown, "radio drama commands the most effective stage. No medium — not theater, not film, not television — has more sheer space in which to achieve the basic goal of drama, telling a story. ... Radio plays itself out in boundless space — the listener's

mind. Your mind."

Radio personality and 1995 Radio Hall of Fame inductee Herb Kent has enjoyed a rich 50-plus year broadcasting career, which includes a stint as one of the "Good Guys" on Chicago's WVON(AM) in the 1960s.

Kent was known as "The Cool Gent" when he was at WBEE(AM) in Chicago.



(Left to right) "Lone Ranger" announcer Fred Foy; humorist and 1995 inductee Stan Freberg; actor and 1995 inductee Les Tremayne; sportscaster and Radio Hall of Famer Harry Caray; 1995 inductee for the "CBS World News Roundup," present anchor Bill Lynch; and 1995 inductee and sportscaster Jack Buck.

Now on WVAZ-FM in the Windy City, Kent graciously thanked all the people who gave him a hand when he needed one through the years, including his fans.

Casey Kasem, host of the syndicated Westwood One chart show "Casey's Countdown" — 1995 Billboard Adult Network/Syndicated Program of the Year — introduced Hal Jackson, a pioneer radio broadcaster.

Career of firsts

Jackson's resume is brimming with landmarks such as broadcasting for the American Negro Baseball League on WOOK in Washington, D.C., and decades of popularity at some of New York City's biggest stations: WABC, WMCA, and, at present, WBLS-FM, where he is the host of "Sunday Classics."

Jackson said he had been fortunate in his career.

"My journey has been characterized by firsts," he said. "By breaking barriers and opening doors. We black broadcast pioneers had to invent ourselves."

Play ball!

Introduced by Radio Hall of Famer, and voice of the Chicago Cubs, Harry Caray, and retired Executive Vice President of Anheuser-Busch Companies Mike Roarty, legendary sportscaster Jack Buck — the voice of the St. Louis Cardinals and member of the Baseball Hall of Fame — said he was proud to accept the honor of being inducted into the Radio Hall of Fame.

"Turn the radio on, you'll hear a friend," said Buck. "You will enjoy, you will learn, you will imagine, you will improve."

National Public Radio's Susan Stamborg

announced the induction of "The CBS News World Roundup."

The program's first anchor, Robert Trout, current anchor Bill Lynch, and producer Steve Ballin celebrated the induction of the famous news program — the longest running, continuous newsbroadcast on network radio, soon to begin its 58th year. The first broadcast was on March 13, 1938, two days after the German invasion of Austria; Trout was the anchor, and Edward R. Murrow contributed a report.

Local radio

Following a taped retrospective on talk radio, which was punctuated with a clip from Don Imus's morning program, Museum of Broadcast Communications Founder and President Bruce DuMont inducted Bob Steele of WTIC in Hartford, Conn.

Steele has had an association with WTIC for almost 60 years; he started there as a staff announcer in 1936, and began doing mornings in March, 1943.

"Next to my family," he said, "I love radio more than anything in the world."

Behind the mic

The Radio Hall of Fame's Emerson Award, which takes its name from the Emerson Radio Corporation, founders of

continued on page 24 ▶

Hall of Fame Worth the Trip

When in the Windy City, do not miss the Radio Hall of Fame, located at the Museum of Broadcast Communications in the Chicago Cultural Center.

Housed within this first-floor tribute to radio's 75 years is memorabilia from such radio greats as Charlie McCarthy and Fibber McGee, whose closet can be inspected firsthand. Jack Benny's fortune, all \$39 of it, can be viewed in his "vault." A selection of vintage microphones and radios is on display.

The Lynne "Angel" Harvey Radio Center, a state-of-the-art studio, is the home of two programs: radio historian Chuck Schaden's "Those Were the Days" (broadcast locally on WIND), and Bruce DuMont's "Beyond the Beltway" (nationally syndicated). The studio is available to radio stations for remote broadcasts (live audiences can be present).

Visitors can listen to more than 50,000 hours of radio broadcasts and advertisements at this wonderful cultural landmark, one of only two broadcast museums in the United States (the other, the Museum of Television and Radio, independent of the Museum of Broadcast Communications, is located in New York City). Admission is free.

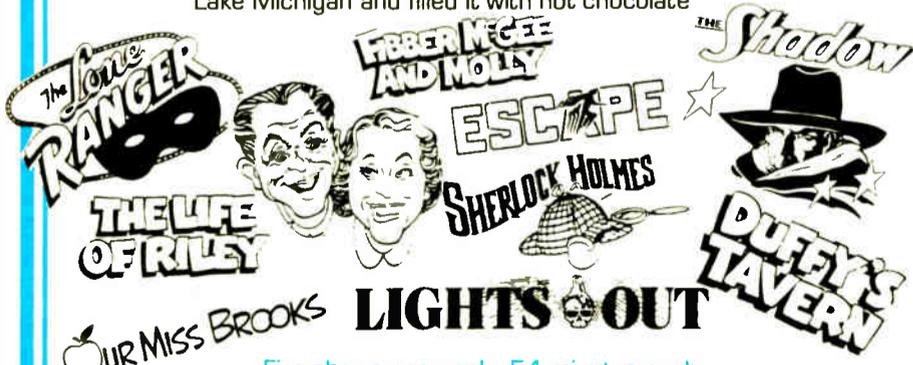
— Alan Haber

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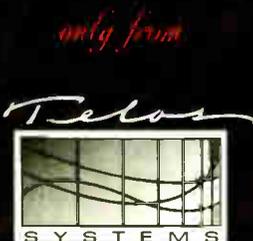
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DENON
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Keep Spots Focused on Client

by Ty Ford

BALTIMORE The central idea in this multipart series is that a radio station does not sell air time, it sells access to its listeners.

Right behind the audience in importance is the client. In fact, one of the many points that keeps surfacing is the quality of service to the client. It is this lack of quality that caused radio to lose its client base to ad agencies in the first place. While some stations tried to put a positive spin on the migration by glad-handing the ad agencies, the truth is that radio stations lost control of their clients.

Getting the power back requires person-hours, consideration and the development of the right attitudes in a way that surpasses the efforts of the ad agencies.

The days of having the caffeine-soaked production director or creative director take the fast food restaurant napkin with the six phrases hastily scribbled by the account executive (AE) after a brief meeting with the client is history. This approach has a very high failure rate because it is simply not servicing the client properly, and that's because the creative department usually has not spoken directly to the client.

The interview

I have received e-mail from production directors who have told me that their sales manager or general manager has forbidden them to contact the client. Instead, the production director or creative director is given a fact sheet or notes by the account executive and told to "come up with something real creative."

In frustration, one production director tried the idea of creating a questionnaire that the AE would take to the client. This is not as good as doing it in person, but even that was refused. It doesn't matter who does the gathering of information:

account executives, production directors, creative directors are just titles. The important thing is that they interview the client. Maybe the creative director or production director doesn't have the "people skills" that your AEs have. That is a legitimate problem. Maybe your creative director or production director wears holey jeans and a T-shirt. Maybe if you offered them greater responsibility and a nominal pay raise with the understanding that part of it would go for a new wardrobe, they would rise to the occasion and surprise you.

If you are committed to upgrading this area of your radio station, give your existing employees first shot at the position. It's a nice thing to do and it's a lot more time consuming and costly to find someone new.

In the worst possible case, you've got the wrong person for the job. Later, I will tell you how to find the right one — but let's get back to the client.

This is how the process should work:

If you are committed to upgrading this area of your radio station, give your existing employees first shot at the position.

After determining the buy, the account executive should hand the client off to the creative director or production director, so that the client can be consulted to determine the best approach. At stations where roles are not so well defined, the same client-serving processes can be undertaken by whoever is charged with the task. The results of the consultation will then be used to create the spot, or

better yet, campaign.

Notice I said campaign. By getting your client used to the idea of a campaign you establish the expectation of a long-term relationship. This is also a great way to handle the problem client who wants to put too much information into one spot. Instead of overcrowding the spot with too

RADIO spots

many copy points, you can create a campaign of however many spots are needed to properly address all of the client's needs.

Use the pearls of wisdom approach. Listen to and make note of the client's ideas, the "pearls." Not every idea will be a good one, but your job is to collect each one. Then, string these pearls of wisdom together with your own creativity and continuity.

The great thing about this approach is that when you bring clients into the process and use their ideas, they are much more prone to accept your finished product because they are substantively invested in the creative process.

By the way, if it's a first-time client, find out where he or she has advertised in the past, how effective it was, what they liked about it, what they didn't like about it. If it's a return client, find out how well things went last time.

Avoiding problems

Find out what complaints, if any, the client has. Look for any information that will help fine-tune the new approach.

If the client knows, find out how the reach and frequency of previous efforts compare to industry standards. If they are buying too short, they won't get the

results, and they may blame it on you. Your job is to sell them results so they give you return business.

Not every client is a wellspring of creativity. In Part Six I will provide a menu of commercial ideas that you can use to prompt your clients through the process.

Again, the benefits of this approach are two-fold: the creative director or production director's time and energies are not wasted in second-guessing what the client may like, and you have hedged your bet that the client will approve the spot by involving them in the process.

□ □ □

Ty Ford is preparing an attractively priced three-cassette box-set of the almost two-hour long session from NAB '95. He may be reached at 410-889-6201 or Tford1010@aol.com



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Radio Comedian Fred Allen Spread Holiday Joy

by Richard W. O'Donnell

PORT RICHIE, Fla. Back during the Depression of the '30s, Dorchester, a sprawling residential section of Boston, could hardly be classified as the happiest spot on earth. There was an epidemic of unemployment, jobs were scarce indeed, and belts had to be tightened.

Still, from time to time, happy faces could be spotted amid the despair. This was especially true at Christmas when the good people of Dorchester, mostly Irish Catholic, somehow managed to pinch together enough pennies to assure loved ones gifts on the great day.

Then there were the "mystery Christmas presents." They came from nowhere during the holiday season, and lifted gloom from desolation, and replaced it with delight. Nobody knew who sent them. Once they arrived, for a few days, at least, hard times were forgotten in Dorchester.

There was another reason for joy in Dorchester. A local boy had made good! Fred Allen, a vaudeville juggler, had hit it big on the radio as a comedian. There was even talk he might soon be making movies out in Hollywood.

The waiter's suit

"It's Town Hall tonight!" the announcer called out over the radio. "And here comes Fred Allen now, leading Jack Benny and a parade of guests."

Clancy got up from his chair long enough to snap the parlor radio off. "Can't

stand that guy," said Clancy as Allen's squeaky voice faded away. "Give me 'Pick and Pat' every time. They're what I call funny."

"Fred's funny too," his wife Maggie insisted.

"Funny!" scoffed Clancy. "What's funny about Washington and politicians? That stuff Allen does leaves me cold."

"You're jealous of Fred," countered his wife. "He grew up in the same neighborhood. He's on the radio making big money. You're sitting home doing nothing."

Clancy snarled, but didn't say a word.

"What about the waiter's job?" his wife thought to ask.

"They wouldn't hire me, Maggie," her husband said sadly. "They said I had to have one of those black suits the waiters wear. They told me they'd be able to give me work if I had one of those waiter suits with the black bow ties."

Maggie sighed. "It's going to be a sad Christmas," she said before heading for the kitchen to do some ironing. "No money's coming in, and everything is going out. There will be no joy for us this holiday."

Clancy waited until his wife left the parlor, and then switched the radio back on again. Why not? Jack Benny, a favorite, was a guest with Allen.

Allen was doing "The News of the Week," a regular feature of the show, and was interviewing a character named Tufton Pumps. "Tell me, Mr. Pumps," the comedian said, "what did you think of the

cold wave?"

"Worst weather I've seen in ten years, 'cept for one year," said Pumps in his best Maine twang.

"What happened that year?" Allen asked.

"Nothing," said Pumps, matter-of-factly.

"Nothing?" said Allen, surprised.

"Broke my glasses that year," said Pumps. "Couldn't see a dang thing that year."

The radio audience roared. So did Clancy.

The next day, Christmas Eve, a messenger knocked on the door of Clancy's flat. Clancy, it should be noted, was not his real name. The messenger left a Christmas package and departed. Inside, there was a black waiter's suit that fit Clancy perfectly.

A new smile

Quite a few people in Fred Allen's old neighborhood were listening to him that Christmas week. Mrs. Cappadona was one of them. She almost burst into a smile when Jack Benny tried to sell her old neighbor a second-hand car.

Mrs. Cappadona had trouble smiling. True, there was a depression. But her husband had a steady job. It didn't pay much — enough for food, coal and other essentials. Every extra penny was being saved to buy toys for the children at Christmas.

Nevertheless, Mrs. Cappadona was reluctant to smile. All of her upper teeth had been removed a few months earlier. She lacked the money to buy an upper plate. She did not have the \$42 the dentist wanted. Truly, this was a shame. They said

when Mrs. Cappadona smiled, she was the most beautiful woman on Dorchester Avenue. Now all that beauty was gone.

The morning after the Allen show — on Christmas Eve, to be specific — Mrs. Cappadona received a telegram from her dentist. She couldn't afford a phone. The doctor wanted her in his office immediately.

"It's a good thing I made those impressions," said the dentist, as he placed the brand new set of uppers into Mrs. Cappadona's mouth. "You'll be able to enjoy a hearty Christmas dinner."

"I can't pay for these," the woman reminded him when she was able to talk. "I don't have \$42."

"The teeth are a Christmas gift," the dentist revealed. "They came from an old friend."

"I don't have any friends who can afford \$42 gifts," said Mrs. Cappadona as she was leaving the dentist's office.

"Yes you do," he assured her.

The woman smiled. It was truly beautiful, Cappadona, it must be pointed out, was not her real name.

A red fire engine

Margaret O'Shea was another Dorchesterite who enjoyed the Allen radio show that Christmas week. She had every reason to be happy that night.

"Say Jack, did Mary Livingstone come along with you?" Portland Hoffa, Allen's real-life wife asked Benny about his own real-life wife.

"No Porty," Benny responded cheerfully.

continued on page 23 ►

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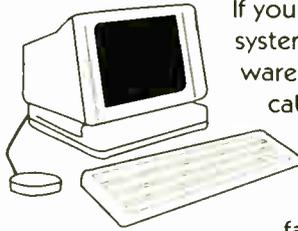
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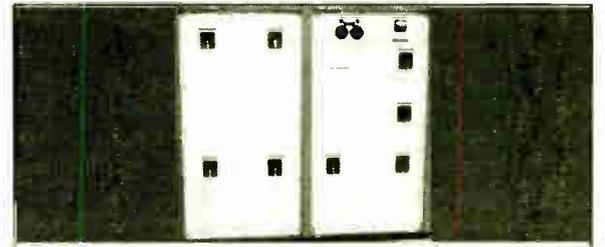
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PROMO POWER

Cover All Your Promotion Bases

by Mark Lapidus

WASHINGTON This probably will not come as a surprise to you. However, unless you are involved with a duopoly or multiple ownership, this topic is likely something that you have not stopped to think about: Most radio stations have the same programming and promotion problems.

Yes, regardless of format or market size, all radio stations are basically small businesses fighting for market share. Every station has its fair share of creative types, clock watchers, get-it-done staff, beginners and seasoned veterans. Look over this short checklist and see how many of these items could affect your success in the coming year:

Frequency & Name: This may sound incredibly simple, but believe it or not, saying a station's name (or call letters) and dial position on a regular basis is a problem for a lot of stations. I have heard a lot of excuses from program directors on this topic too. "Oh ... we've been in this market for decades ... people know who we are." is all too common a defense.

Times per hour

A related problem is not saying frequency and name enough times per hour. Consider this; if the typical drive in your city is about 15 minutes and you only identify your property every 15 minutes, it is possible for someone to listen to you and not even realize it was you!

I have seen no evidence to indicate that telling someone who you are after every song damages time spent listening. Yet many managers assume that this is too much repetition. Part of this feeling may be a station's lack of creativity when it comes to producing this element properly with jingles, characters or listener voices. Take a cue from television: many TV stations now have a "bug" in the lower right hand corner

all the time. It has not had a negative effect on viewing habits.

Promotion announcements: 1) Reach and frequency: How many announcements on your station does it take to reach one listener at least three times? Ask your promotion and program directors and watch them squirm! While they want exact answers when they buy television time, many managers take a guess at reach and frequency on their own stations.

Every station should have set minimum numbers for major, medium and small promotion schedules on-air. If you adopt this stance, it is much easier to plan for numbers of promos aired and you will find that they are much more effective!

Do not permit your station to become predictable.

2) When they play: A lot of program directors will code commercials so that the best spots air in the first stop sets. Then they put the promo at the very end of the stop set. The idea here is to reconnect the radio station to the music played. This can be done with a jingle, stager or jock. Do not put a promo at the end of five spots.

Common sense

It is common sense to realize that when you do this, fewer people will either hear it or pay attention to it. Another method that I prefer is to place promos outside of stop sets altogether. Run the recorded promos between songs. Read the liners over music intros. Make your message foreground.

3) Are they fresh? Do not run promotion announcements into the ground. If you are airing a heavy schedule, cut two promos and rotate them for three days.

Then, change those.

Do not permit your station to become predictable. When a listener says to himself, "Gee, now I have to hear this stupid announcement about WXXX's next contest of the entire week," you're in trouble.

High maintenance

Morning Show: Because morning shows are our prime time, they require highly creative talent. This comes with maintenance responsibilities. This is difficult, if not impossible, when program directors and promotion directors are not able to interact properly with the morning show. This relationship requires daily meetings. These can be very short meetings, but they need to take place for communication purposes.

This is no less true for a team that has been on the air for one year than one that has been on for 10. The promotion director needs to know what special needs the players have and what promotions they may want pushed in the press. The program director must do regular critiques with the talent.

This may translate into talent going over their own airchecks to discover what's right and wrong. Morning mapping (planning the show) for the next day has to take place the day before. Very few jocks can fly by the seat of their pants each day.

It is also vital that the morning show hear their direct competition regularly. This means that somebody has to tape shows for them. Too many morning talents live in a vacuum, where they don't hear what's going on around them. They may not be giving their competition enough credit when it comes to scoring listener points for playing more music or being faster with topical information. Speaking of competition ...

Competition: There is a reason why every station has a top sharing competitor. Your listeners like that station! This is a hard

fact for many managers to swallow. If you share thirty percent of your audience with another station, then your listeners do enjoy something about them.

It is ridiculous to go on the air making fun of people that listen to your direct competitor. In this instance, you would be telling thirty percent of your audience that they have lousy taste and judgement. This is not a good way to make friends.

Jocks Feel Out of Touch: You're on the air. The request line rings with a question about a station promotion, a concert in town or a question about a song. You're unable to answer because you can't find the information in the control room! This makes you feel like an idiot. If it happens enough, you begin to feel that nobody at the station trusts you and that your management team is inept.

The truth is that many program and promotion directors are so busy that they just do not think about putting the details with-in reach.

Simple solution

This is easily fixed. Every announcement read on-air should have notes at the bottom for the jock. If you are promoting an event, include the directions and phone number. For recorded announcements, put the copy in your control room "copy book," again with details at the bottom. That same "copy book" should have the latest concert schedule for your town, phone numbers for all the venues and addresses for the appropriate items on the World Wide Web. Every control room should also have song reference books with chart positions, artist bios, and anything else that can make the jocks sound like trivia geniuses.

Are there more common problems? Does every station have a salesperson that either acts or dresses like Herb on WKRP? We'll cover more in future articles.

□ □ □

Mark Lapidus is the director of marketing for Liberty Broadcasting. Reach him care of RW.

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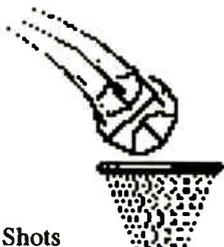
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READER SERVICE NO. 95

Fred Allen Remembered His Roots with Christmas Gifts

► continued from page 20

"She's busy with her Christmas shopping."

"Christmas shopping?"

"Yes," said Benny. "Right now she's over at a department store putting me through bankruptcy."

"That gives me an idea," cooed Portland hopefully. The studio audience chuckled, and then burst into laughter when Allen chimed in: "Steady girl, steady." In itself, the remark wasn't funny, but when Allen said it,

after his parents died.

Elizabeth Lovely, Nellie O'Connell and Rev. William Ryan, pastor of St. Margaret's Church in Dorchester, are all gone now. So is Fred Allen. The great comedian passed away in 1956. The ending of this story, in which all four played key roles, can now be told. They were the ones responsible for the "mystery Christmas presents" delivered to countless Dorchester dwellings during the depression years. In fact, in the '40s, when there was prosperity, the gifts continued to be delivered to those who needed a helping hand.

"Fred Allen never forgot where he came from," said Nellie's son, Daniel. "One time, one of the kids on a local baseball team got hurt. Fred paid the medical bills and nobody ever knew he did."

"Fred lived with his Aunt Liz, her husband Mike, and another aunt, Jane Herlihy. They lived on the second floor, and I lived on the first floor with my mom and dad. Fred was a good man, a kind man. He was always helping people. He never wanted to be thanked, though. Maybe that is why he did what he did so quietly. Every year during the depression, Fred sent a check to his Aunt Liz. It always came a few weeks before Christmas, and it was always a big check. Fred believed in sharing his blessings."

"There would be a note with the check. Fred always asked his aunt to check out families in the old neighborhood, and to help those who needed a helping hand at Christmas. He always wrote, 'Use your good judgement, Aunt Liz. You'll know the ones who really need help.'

"Then Mrs. Lovely would call my mother upstairs, and they'd swap information for an hour or so. After that, Aunt Liz and my mother would go over to our parish church, St. Margaret's, where they'd chat with Father Ryan, the pastor, for quite a while. He'd make some phone calls to other priests, and ministers and rabbis in the area, and eventually a list of people in need of help at Christmas would be compiled."

"If there was a real emergency, Mrs. Lovely would go right over and hand the people some money," said Dan O'Connell. "In most cases though, the gifts, or money, were sent anonymously. Those who needed help never knew where it came from."

Towards the end of his Christmas show five decades ago, Fred Allen stepped out of character long enough to say: "From all of us here in the studio to all of you at home, may your Christmas be a joyous and blessed one."

If you are still alive Clancy, and Mrs. Cappadona, and Margaret O'Shea — you now know the identity of your mystery Santa Claus of years ago.

He had baggy eyes.

□ □ □

Richard O'Donnell is a semi-retired writer living in Florida who formerly wrote an "off-beat" news column for the Boston Globe. Reach him care of RW.



Radio's Mystery Santa: Fred Allen

in that nasal twang of his, it was pure joy.

In her parlor, Margaret O'Shea, not her real name, doubled up with laughter. She was a happy woman. Her husband was earning enough to get by on, and there would, after all, be gifts for young Tommy. They were concealed in a bedroom closet. Where they came from, she would never know. The doorbell rang, and there was a messenger loaded down with Christmas toys, including the red fire engine her son had dreamed of owning.

Tommy, who was five, wanted to be a fireman. A few days before Christmas, the boy had been hit by a car near his home. It wasn't the driver's fault. The youngster came out of nowhere. The injuries were minor, and the boy spent only a day in the hospital. But the money used to pay hospital expenses left the family penniless. There wasn't any money left to get Tommy his Christmas toys.

Disappointment

"I have saved that money to buy Tommy some toys," the mother confided to her neighbor, Nellie O'Connell.

"Maybe something will come up," Mrs. O'Connell declared. "Maybe there really is a Santa Claus out there, and maybe he will drop by your house this Christmas."

Margaret O'Shea returned to her flat broken-hearted that day. As for Nellie O'Connell — and that was her real name — she headed across the street to confer with her good friend, Elizabeth Lovely — Fred Allen's beloved Aunt Liz, the woman who raised him on Grafton Street in Dorchester

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Harry Caray Thrives on Sports Radio Action

by Alan Haber

CHICAGO At the 1995 Radio Hall of Fame broadcast, legendary Radio Hall of Famer and voice of the Chicago Cubs Harry Caray inducted sportscaster Jack Buck, with the help of Anheuser-Busch Companies retired executive vice president Mike Roarty.

Caray reflected on the broadcast and on radio sports programming with RW's Alan Haber.

RW: Did you enjoy the broadcast?

C: I enjoyed it very much. You know, if it wasn't for radio,

sports wouldn't be what it is, and if it wasn't for sports, maybe radio wouldn't be what it is. They complement each other. It has been a long marriage for over 70 years, without a divorce.

RW: What do you think the big changes have been over the years in radio sports programming?

C: Well, I don't know — I think there are more (sports talk shows) than we ever had before. I think that — for example, take baseball. I think baseball is more of a radio game than it is TV. An announcer on radio can use his imagination, his vocabulary, his sense of drama. But on TV,

then you're talking too much, because (viewers) can see for themselves. I know one of the things maybe that made me was when there was no television — you could make even a dull game sound exciting (with) only the announcer. On TV you cannot do that.

RW: Ballgame announcers seem to be the most energetic and emphatic announcers around.

C: You know, I broke into radio in Joliet — WCLS. And one of the first things I had to do was broadcast bowling every Saturday night. Every Saturday night, they had two star

bowlers that would bowl a match, would pack the bowling alley. As you know, (bowling) was a big sport then. And I guess it still is.

RW: What's the difference in announcing various sports on the radio?

C: Well, I'll tell you. The slower the sport, the better the announcer has to be. Everybody talks about hockey and basketball announcing — that is a cinch. All you have to do is say "The ball to so and so, Smith to Brown to Smith, two points." That's basketball ... hockey, same thing. The action is so fast. But when you get to slower games like baseball and football — you know, I think it has been proven that the ball is in play only 15 minutes in an hour football game. So the announcer has to have something to hold the interest of the people, other than the action itself.

RW: Of course, announcers have to think on their feet to fill in the slots when there's a rain delay and so on.

C: Well, that you always have to do if you are in radio or TV. You never know what is going to happen.

Radio Hall of Fame Celebration

► continued from page 16

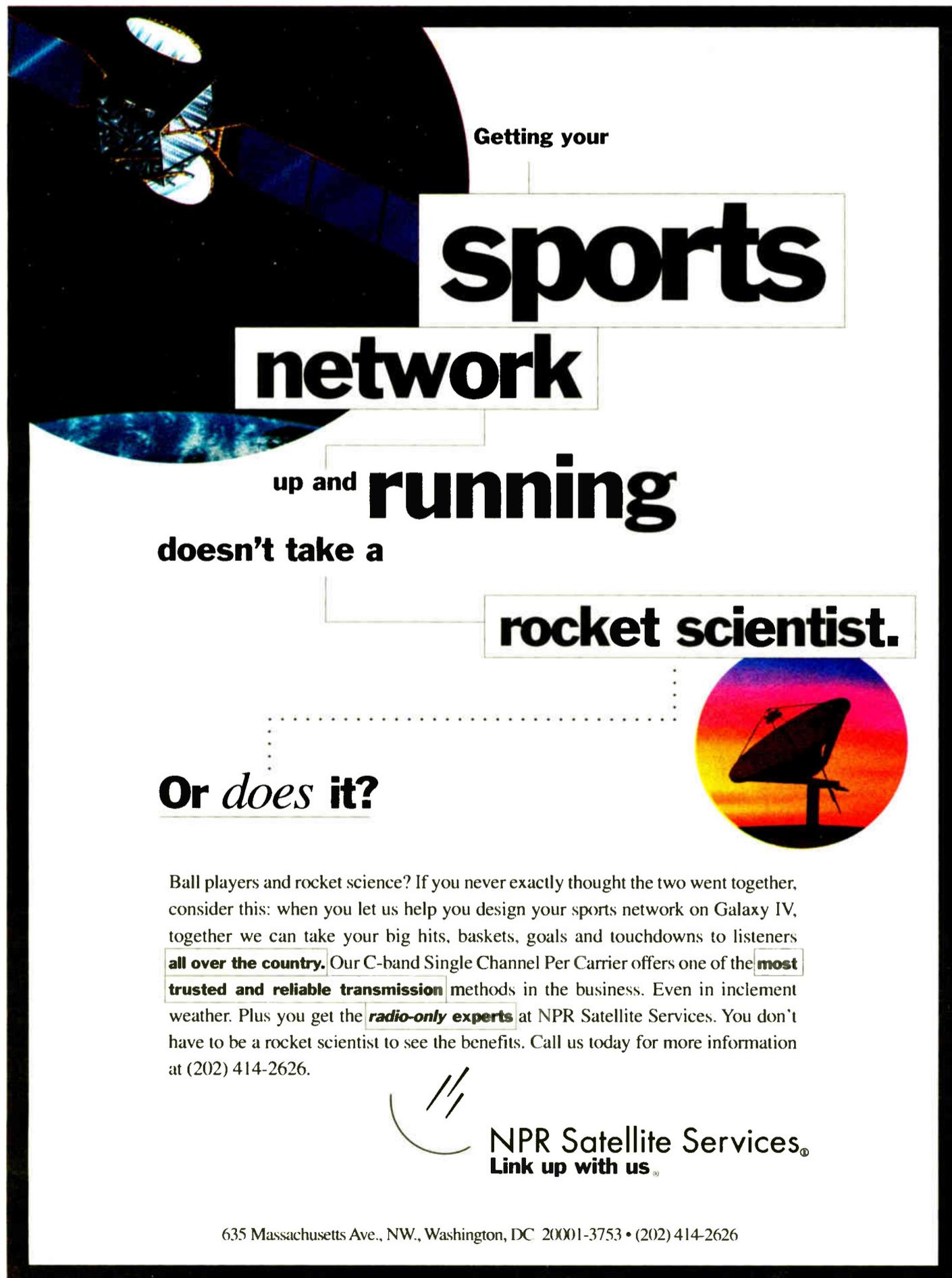
the Hall of Fame, and honors "distinguished lifetime achievement in production, management or technology," according to the Museum of Broadcast Communications, was bestowed upon Edward F. McLaughlin.

McLaughlin is the former president of ABC Radio (1972-1986), and now Chairman and CEO of talk radio production company EFM Media Management.

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Visiting Bach and Holiday Cheer on the Internet

Plug In, Log On and Surf the Universe for Sites on Classical, Information, Sports and Bob and Tom

by Alan Haber

ALEXANDRIA, Va. Well, how about that? Another year gone and another about to start. Auld Lang Syne and all of that. Hope you are having a great holiday season. Here at the ever-busy global Haber Space headquarters, deep in the heart of cyberspace, we're whooping it up big time.

Hey, what can I tell you? We get the



best of all possible worlds at this time of the year — not only do we get snow and presents and eggnog and snow and eggnog and presents and snow, but we also get to preview the new spring fashions with a simple trip to the local cybermall!

Yippee! It's a serious dose of cyber-nirvana! Let's take advantage of all of this good cheer and see what's up with radio as it travels down the information superhighway, decked out in all its holiday splendor.

Neat-O Site

You know, surfing the Web for cool radio station sites is a particular pleasure of mine (big surprise, huh?). It is even more satisfying than usual when I come upon a site as nicely designed as that of WCLV-FM, Cleveland's classical outlet which has been spinning good music since 1962.

The home page is without a doubt neat-o to the max. Against a nice custom-white background populated by the lightest of yellow streaks sits WCLV's attention-getting logo. Next, you are presented with seven clickable buttons, each one ready to take you to a different area of the site.

The buttons, by the way, are super-looking, and colorful to boot! I particularly like the one that whisks you away to information on WCLV's programs; it sports a stately vision of the Man Called Bach. The button that brings you to information on the station features a photo of the WCLV building. And the "WWW Links" button, which takes you to a list of classical music-oriented and other like-minded links, has a photo of the good ol' earth.

WCLV uses its home page to toot its

own horn with solid information about the station. For example, you can find out about WCLV's pegging by the International Radio Festival of New York as the best classical music station in the world. You can talk back, via e-mail, to the station by clicking on a link at the bottom of the page.

WCLV has taken the opportunity to include some information you do not normally see on a radio (or TV, for that matter) station's Web site: demographics, and a bunch of quotes from advertisers collected under the banner "Advertiser Success Stories." Pretty unique, and pretty smart — potential advertisers and listeners need only look at this information to know they are in good company at WCLV.

Webmaster Steve Sileo is serious about this Web stuff. He told me he thinks radio may be Internet-only in 25 years. Just think: A worldwide audience for all!

Top all of this off with a history of the station and bios and photos of the on-air personalities, and you've got a great site. And look out for Real Audio clips in the future. Check out my Neat-O Holiday Site of the Month at <http://www.wclv.com>. A round of jingly bells for a job well done!

Holiday mailbag

Ho-ho-ho! Let's dip into the e-mail-bag and see what the cyberpostperson has brought us. Oh, it's another fruitcake! Yecchhh!!!

Well, thankfully, there's some real e-mail, too. Like a missive from John Covell, senior producer, City Visions, at KALW-FM — "Information Radio" — in San Francisco. Not much going on graphically at this site (<http://www.ins.com/kalw/>), but information-wise, it's a winner with program updates, program listings (listed by day, time and title — a great, helpful idea), station information, and e-mail letters sent to the site and answers to the letters.

Dan Mettler, chief engineer at WFBQ-FM and WNDE-AM in Cleveland, wrote to invite me to drop into his stations' sites (he's also chief at WRZX), which I did. WFBQ's pages (at <http://www.wfbq.com/Q95/>) heavily promote the station's nationally-syndicated duo, Bob and Tom (who have their own site at <http://www.bobandtom.com/bobandtom>).

All of the clickable icons on the home page feature a cartoon drawing of B&T, but you can send e-mail to all of the Q95 jocks and staff, and find out about "Cool Q95 events." You can do other stuff here too, of course. The home page could do with a background, though.

Sports station WNDE's site (<http://www.bit-wise.com/wnde/>) is light years ahead of WFBQ's, graphically speaking, with custom font-based hypertext links (in a variety of colors) and a nice logo on the home page. All of this sits on top of a custom transparent background featuring

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[quick]

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WORKBENCH

Solve Remote Receiver Problems

by John Bisset

SPRINGFIELD, Va. Not that we want to develop this column into the "ISDN NEWS," but we ran out of space last issue before telling you about our fits and starts with the Tone Commander NT-1.

We've had a number of clients use this device and even after the factory-supplied software updates and replacement units, we find it is unreliable in the greater Bell Atlantic ISDN area.

In discussions with other users, we understand the problem is nationwide. Our experience is based on over two dozen Zephyrs operating in over 100 locations for nearly two dozen clients.

Typical problems are an inability to remain synchronized with the phone line during the initialization process or having the unit fail to recognize a connected ISDN line when the unit is not used over a long period of time. Either instance results in a failed remote, angry clients and angry salespeople.

As the engineer, you take the heat for the failure. You also have to explain the costs to the station when the phone company proves the ISDN line is functioning properly and bills you for the unneeded "emergency dispatch."

A suitable replacement, which has operated for the past two months flawlessly, is the

Motorola NT-1D with external power supply. The Motorola is only slightly more expensive, and can be ordered from Kandy at Broadcaster's General Store. Her number is 404-425-0630, and we appreciate both her and Infinity's Tom McGinley sharing this information with us.

There is a serious problem with a DSR-3510 that runs warm.

(Our clients also appreciate the now-reliable ISDN remotes, Kandy.) Rich at Telos has had good reports on the Northern Telecom NT-1 as well.

★ ★ ★

In the Oct. 4 RW, we described some problems that John Rohwer of WZZT experienced with the Scientific Atlanta Encore DSR-3610 satellite receiver. John wrote to *Workbench* to express his frustration with operating the receiver and with the technical support he received from both SA and ABC.

I received a very helpful letter from John Woodford, director of technical projects at ABC, offering to assist in rectifying WZZT's problems. Woodford also asked to clarify some of the points referenced in that *Workbench* column.

To begin with, the SA Encore

DSR-3610 is not supposed to run "warm to the touch." In fact, Woodford stated in his letter that there is a serious problem with a DSR-3610 that does run that warm. Both ABC and SA are committed to exploring this or any other problem, and to correcting them as well.

John Woodford also wanted to clarify the LNB power jumper issue. Higher-grade receivers provide an option to enable or disable the LNB power, and the Encore falls into that category. The LNB power strap should be installed if power from the SA receiver (and not from some other power source) is desired.

The issue of audio levels was raised as well. ABC Radio's house standard for many years has been +8. It was decided to incorporate this standard into DAT receivers because it represents a unity gain output at the receiver with respect to the levels run in the ABC studios.

Although ABC reports few encounters with stations unable to handle this level, it might help if they would include a chart of resistors and pads for providing alternatives to +8 into 600 ohms. At the very

least, providing a source for pre-made pads such as those manufactured by Excalibur and sold by Bradley Broadcast (800-732-7665) makes sense.

ABC had the courtesy to send me a copy of the Encore tech manual, which was obviously not "thrown together." In fact, the section on C-Band interference, its causes and solutions, is worth the price of the manual — even if you do not own an Encore.

Also accompanying John's letter was a copy of the ABC/SMN Satellite Operations Guide for use with the SA AD-4595. In addition to equipment recommendations, the guide includes a maintenance checklist and procedures for finding azimuth and elevation angles. If you are an ABC/SMN affiliate, and don't have a copy, contact the ABC 24-hour technical operations center hotline at 212-456-5555.

We've passed on Mr. Woodford's letter to WZZT and will keep you apprised of any future developments.

★ ★ ★
Next time you have to install new computer or telephone jacks in the wall, stop by your electric supplier and take a look at the new Caddy MPLS wall bracket. The Caddy plates will reduce your install time by a third. You simply cut the standard rectangular hole, then, using the bracket as a template for the hole, insert the wall plate bracket and bend the metal tabs to hold the plate in place. For a more secure anchoring of the plate, Caddy includes two drywall-type screws that pass through the front of the plate and anchor to the metal tabs. If you are interested in a free low-voltage applications brochure, circle **Reader Service 29**.

□ □ □

John Bisset is a principal with Multiphase, a contract engineering firm based in Washington, D.C. He can be reached at 703-323-7180. Fax submissions for the Workbench column to 703-764-0751, or through America On Line at wrwbench@aol.com. Printed submissions qualify for SBE Certification credit.

Holiday Cheer Is Easy To Find on the Internet

► continued from page 25

the WNDE calls and frequency. You can find out about what's going on in sports by checking out the events page. You can

even check out the NCAA football lineup, as broadcast on the station. A variety of sports-oriented Web sites, hypertext-linked, of course, is also offered.

Merry happy greetings

Before I go and let you get ready for New Year's Eve (remember: don't drink and drive through cyberspace). I thought I would list a couple of holiday-type sites for you to visit.

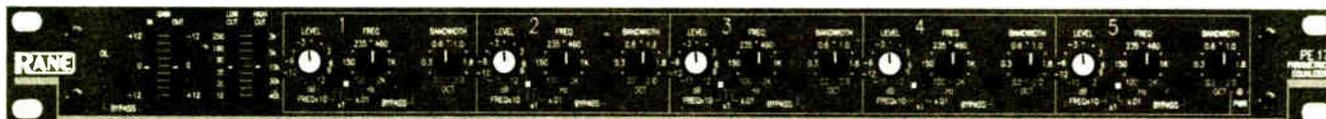
You can visit the North Pole, talk to Santa, Rudolph (of Red-Nose Reindeer fame) and the Elves at <http://www.town.hall.org/santa/>.

A real clever holiday (well, sort-of) site, called the "12 Sites of Christmas," is at <http://www.netsurf.com/12sites.html>. It is presented by Netsurfer Digest and you can take the holiday plunge by clicking on the text links provided. It will be like getting a different present every day of the holiday. I won't spoil your fun by telling you where the links take you, but, trust me, it's fun.

Well, see you next year! Keep letting me know about your stations' Web sites by e-mailing me at zoogang@ix.netcom.com. Have a safe and happy holiday season!

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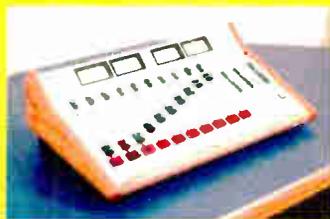
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Audio Consoles

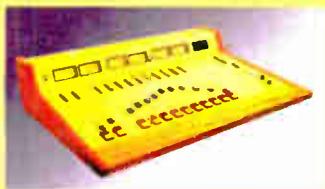
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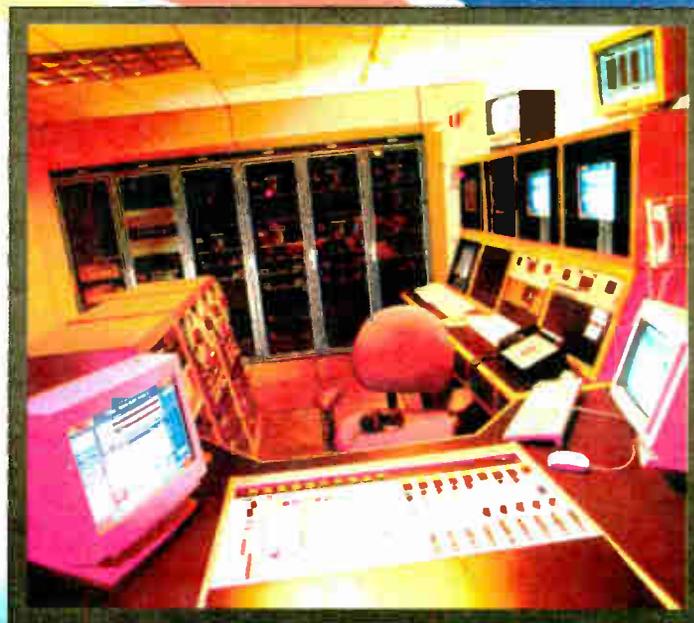
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INSIGHT-ON-RULES

Response to EAS Discussions, Petitions

by Harold Hallikainen

SAN LUIS OBISPO, Calif. In Memorandum Opinion and Order 95-420 (adopted Oct. 4, released Oct. 23), the Federal Communications Commission (FCC) reaffirmed most of the decisions made in its Report and Order of November 1994, adopting the new Emergency Alert System.

The MO&O was issued in response to five Petitions for Reconsideration filed after the summary of the R&O was published in the Federal Register. In addition, the FCC received five comments, five oppositions to the petitions and three

replies to the oppositions.

The major issue for stations is that the deadline for installation of EAS equipment has been changed from July 1, 1996, to Jan. 1, 1997. NAB had petitioned for an extension to July 1, 1997, which is the deadline for compliance by CATV systems. NAB argued that this delay would allow manufacturers to have more equipment available prior to the deadline, possibly reducing prices, avoiding equipment shortages, and giving stations budget flexibility.

TFT Inc., a manufacturer of EAS equipment, opposed a delay in implementa-

tion of EAS. Any delay would put lives and property at unnecessary risk, because the existing EBS tests cause audiences to ignore actual alerts. Further, delays in EAS implementation would delay the availability of consumer receivers.

TFT also argued that a one-year delay would cost each station \$5,200 "in loss of revenue during the lengthy weekly test, training of personnel, recordkeeping activities, and maintenance and repair of EBS equipment." TFT finally argued that a delay in implementation would actually result in an increase in the cost of equipment due to storage expenses for manufacturers.

NAB replied that the savings due to EAS would not accrue until well after EAS is fully implemented. It also replied that a delay would not put lives at risk because stations could voluntarily install EAS equipment prior to the deadline.

The FCC decided that, in the interest of public safety, it is important to move forward with EAS.

Due to delays brought about by the Petitions for Reconsideration (such as the FCC's suspending the testing of manufacturers' EAS equipment), and to allow stations to put the equipment purchase in a later budget year, the FCC delayed the required installation of EAS equipment six months instead of the requested one year.

DBC against RBDS

Data Broadcasting Corporation provides data services such as stock market information, news, and sports to handheld receivers and personal computers over a 69 kHz subcarrier on "more than four dozen" FM stations. DBC has distributed over 60,000 receivers.

DBC would like the FCC to remove the "encouragement" of RBDS found in paragraphs 41 and 49 of the Report and Order. The "encouragement" actually shows up as a permissiveness in the rules (see 11.51(e)).

DBC further requested that the rules restrict the injection level of RBDS used to transmit emergency information to two percent or less, again providing interference protection to their data service.

NAB replied that the DBC-suggested two percent limit was not supported by sufficient data. DBC reasserted its original arguments and suggested the FCC warn FM broadcasters of the potential for interference due to RBDS use.

Finally, Sage Alerting argued that RBDS is compatible with the DBC subcarrier. The problem is, they stated, due to poor design of DBC's receivers.

The FCC decided to make no change in the rule. It will continue to encourage the use of RBDS, but not require it. The FCC decided that potential for interference between subcarrier users is best left to negotiation between the subcarrier users and the station licensee.

No RBDS standards

Sage, Delco and Federal Systems requested the FCC adopt RBDS standards as part of EAS. They also requested that the maximum subcarrier injection level and total modulation limit for FM stations utilizing RBDS for EAS be increased.

The FCC decided that it would not be reasonable to adopt standards for something that is optional. They stated that including the RBDS standards into the rules would slow progress in RBDS, because changes would then have to go through a rule change procedure as well as the existing industry standards adoption procedures.

They also decided that any changes in the FM technical standards (increasing modulation limits) was beyond the scope of this proceeding.

In summary, there were no changes in the rules regarding RBDS use in EAS.

Federal Signal Corporation suggested the rules contain a recommendation to RBDS receiver manufacturers that receivers

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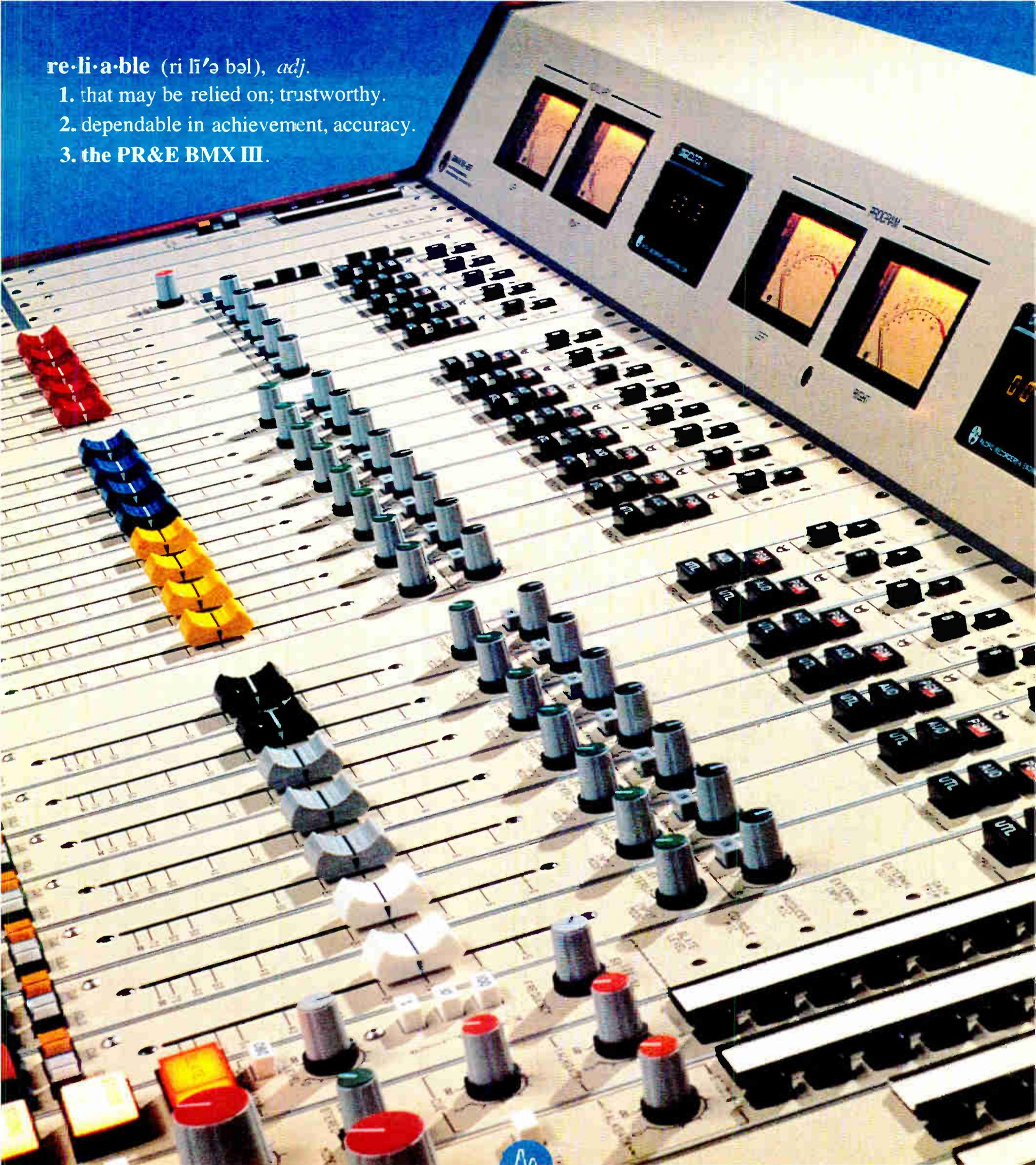


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re·li·a·ble (ri lī'ə bəl), *adj.*

1. that may be relied on; trustworthy.
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EAS Timetable Set

► continued from page 30

include a scanning second RF front end to receive local warning information.

The FCC did not address this in the MO&O.

EAS override

In its petition, NAB claimed that the "cable interrupt" provision violates copyright law in that the CATV system would then not be carrying a television program without modification (such as interruptions). Further, it could result in a cable company interrupting a news broadcast to send outdated EAS information.

Time Warner, in its response, argued that selective override equipment would

be prohibitively expensive.

Citing various court cases and legislative history, the FCC decided that the EAS Override on cable systems does not violate copyright law.

NAB proposed several minor changes to the technical rules. The FCC considered each of these proposed changes and made appropriate adjustment of the EAS rules. The rules were rewritten to clarify the intent that should an EAS header be received without an EAS EOM within a preset interval not less than two minutes, the EAS decoder will be allowed to reset. This prevents the retransmission of dead air or another station's signal in a non-emergency situation.

NAB suggested that a specific type of nonvolatile storage be used to retain EAS data in a decoder. They commented that battery-backed RAM was not reliable enough, possibly because batteries require replacement. They would rather see a non-powered storage medium, such as EEPROM.

The FCC agreed that while battery-backed storage was more vulnerable to data loss than nonvolatile integrated circuits (EEPROM), the problem was not serious enough to require FCC intervention in the competition between manufacturers.

NAB request

On NAB request, the FCC rewrote section 11.33(a)(9) to clarify the requirement that EAS decoders have an indicator for each of the listed three conditions causing a decoder activation.

NAB pointed out that the rules, as written, required certification of encoders or decoders, but notification of combined encoder/decoders.

The FCC corrected this inadvertent error to require certification of each of these devices. Further, the FCC stated it would start accepting applications for certification of these devices 14 days after these rules were adopted, and would begin processing the applications 30 days after the rules are published in the Federal Register.

More details were requested on the 1200 bps RS232 data port required on EAS equipment. Sage Alerting proposed a protocol to allow EAS equipment to communicate with television character generators. The FCC declined to expand upon these specifications.

Various people asked whether the EAS codes were the same as the Weather Service's WRSAME protocol. The FCC stated that they modified the WRSAME codes to meet EAS requirements, and that WRSAME are being updated to match the EAS codes. The two protocols should be identical.

This will allow standard weather radios to be used to drive one of the audio inputs of an EAS decoder.

The rules do not include specific event

codes for various man-made emergencies; instead, they provide for a single code for a Civil Emergency Message. The FCC stated that it would be difficult to anticipate all such emergencies, but will update the codes as new codes are implemented by the NWS and other agencies.

EAS includes location codes for one-ninth of a county, an entire county, and an entire state. It does not include a code for the entire country; however, up to 31 state codes could be included in one header. The FCC decided that this "regional approach" to national emergencies was more manageable than having a single nationwide code.

Several people questioned the inclusion of the authenticator word procedures in national emergency messages (the red envelope). Use of such a method of message authentication certainly limits the ability to automate EAS. However, it appears that this is designed to be used in non-automated stations where an emergency message is received over a wire service, then dropped into the broadcast station web portion of EAS.

System security

Several people raised questions on system security in my discussions with EAS manufacturers and others. It appears possible for someone in a broadcast station to send a false alert. Also, through the use of non-secure circuits, someone outside a broadcast station could introduce a false message into the system. Such a message might be introduced into a VHF or UHF communications channel utilized to send EAS messages from a county emergency operations center to local stations. Such a false message would then be repeated by most of the broadcast stations in an area.

In developing local plans, local EAS committees should give careful concern to the use of secure circuits (dedicated hardware circuits, continuous carrier microwave or RF circuits, encrypted circuits, etc.) to carry emergency information.

EAS is on again!

Summarizing, we now have a new deadline for EAS.

The full text of this MO&O, along with the original Report and Order adopting the EAS rules, is available on the Internet at the FCC's ftp, gopher, and Web sites. To help you find these specific documents, pointers to them are located on our main web page at <http://slonet.org/~hhallika/> and by fax at 805-541-0201. In addition, the full texts of the FCC's NPRM and Report and Order permitting unattended operation of broadcast transmitters are available.

Finally, this is the first Insight On Rules article written in HTML (hypertext markup language). As time permits, previous articles will be converted and put on the World Wide Web (at the previously mentioned Uniform Resource Locator). Articles should appear about a month after they appear in RW.

□ □ □

Harold Hallikainen is president of Hallikainen & Friends, a manufacturer of telemetry and control equipment for the broadcast industry. He also teaches electronics at Cuesta College and is an avid contra dancer. He can be reached at 805-541-0200 (voice), 805-541-0201 (fax), or hhallika@slonet.org (e-mail), and <http://slonet.org/~hhallika/> on the World Wide Web.

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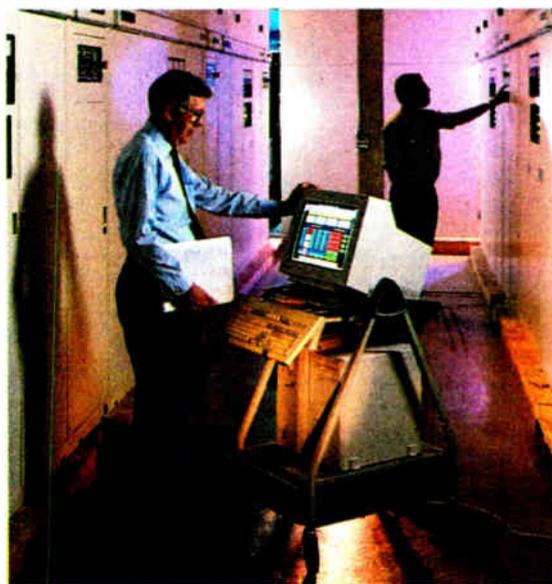
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Upgrades That Avoid Window Pains

Moving Up to Windows 95 Requires Enhancements To RAM and Lots of Space on Your Hard Drive

by Richard Mertz

FAIRFAX, Va. The business sections of many major newspapers contain articles describing the meteoric rise and subsequent sharp decline in sales of Windows 95. I know of only one major user (a bank) that has made the switch. Others are awaiting the release of the updated (and hopefully debugged) version.

I guess it is only inevitable that some time in the near future I will go out and purchase my own, only to be used on one computer, copy of Windows 95. Microsoft appears to have fixed the price at \$89. That's the price, even at Best Buys. I have seen it for sale at Sam's Club for \$82.

I do not really want to spend any more money on hardware. The question is, "Is my existing hardware hardy enough to support the new operating system?" The buzz on the Internet and from Microsoft is that you will only need 8MB of RAM instead of 12! OK, my computer has 8MB of RAM. However, performance of Windows 95 would be enhanced if my computer had more RAM. Currently, 4MB of RAM is running about \$150 to \$200. This purchase will have to wait.

Memory problems

Is there another way to add memory without the cost? I'm not so sure. Several software products on the market claim that they can provide "virtual RAM." What this means is that your application program thinks your computer has more memory space that it actually has. To do

this, RAM compression programs using data compression much like Stacker increase hard disk space by using dynamic compression.

The computer stores have several programs that fit the bill. SoftRam by Synchronys Softcorp claims to work with both the 3.1x versions of Windows and the new Windows 95. At about \$30 over the counter, it seemed like a good choice.

Installation of SoftRam was simple and painless because the install program does all the work. Once installed, Windows must be restarted to activate the memory compression. Well, Windows loaded just fine. The "dashboard" face of SoftRam has meters and gauges (like an automobile) that indicate how much virtual memory you have. In some instances Soft Ram indicated that I had over 20,000MB of RAM! I wish.

Doing fine

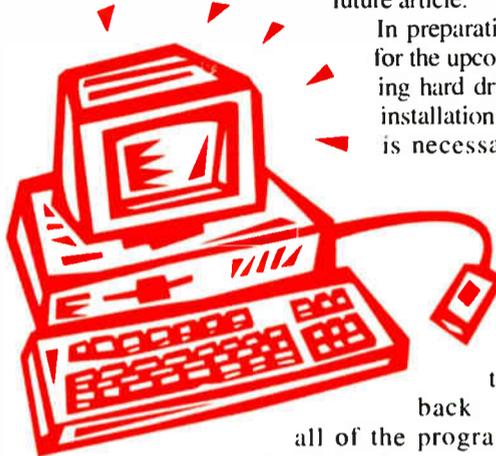
Most programs ran just fine. TurboTax did not. When my Windows was operating using SoftRam's compression, data from my file was corrupt and unusable. Other programs crashed.

SoftRam permits adjusting the mix between the compressed "virtual RAM" and hard "silicon" RAM. I tried this, but it was of no use. Some programs had problems with compressed RAM. As a result, I will be removing it from my system. It seems you can't get something for nothin'.

Moving on, Windows 95 and the

applications written specifically for it take up a lot of hard drive space. I do not think disk compression is appropriate as it would degrade performance. The only solution is to upgrade to a larger hard drive. Prices today are such that you can purchase a complete 1.275GB hard drive upgrade kit for under \$300! Installation of this kit will be the subject of a future article.

In preparation for the upcoming hard drive installation, it is necessary



to back up all of the programs and "garbage" that have accumulated on the existing hard drive. (You are making periodic backups of your hard drive, are you not?)

Some time back I wrote about using tape drives for backups, particularly a 250MB tape drive. For years I have used this drive to back up the entire hard drive (345MB) using two tapes. Recently, 3M came out with an enhanced tape that holds 170MB of

data instead of the customary 125MB.

Data compression is used to back up 250MB of data on the 125MB tape, hence the moniker: 250MB backup drive. With the new 170MB tapes it should be possible to store up to 350MB of data. However, a new compression scheme is needed to work with the older tape drives.

To solve this problem, 3M began packaging Arcada backup software along with two of its new, longer tapes. The Arcada software is designed to work with existing backup tape drives, either internal or the external units that work through the computer's parallel port. You get a DOS and Windows version with this package.

I installed the Windows version of the backup software. Once installed, the software began its configuration by searching the computer for the existence of a tape drive. Once found and configured, a test backup was made and the backup recording's integrity verified. If all works as it should, you can make backups within minutes.

Using the longer tapes and enhanced software I was able to back up the entire 345MB hard drive on a single tape! It seems you can get something for almost nothin' (about \$40).

In preparation for Windows 95 when it comes to RAM, give me the "hard" stuff. Thanks to 3M, there is some additional life left in the old tape drive.

□□□

Richard Mertz is a principal at Suffa & Cavell, a consulting engineering firm in Fairfax, Va. Reach him at 703-591-0110.

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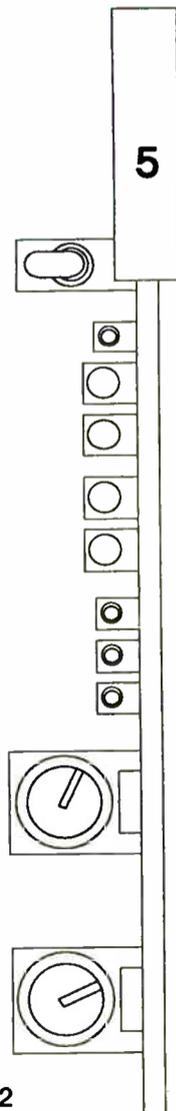
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KEYBOARD CONNECTION

'What If' Program for AM Stations

by Barry Mishkind

TUCSON, Ariz. Aside from interest in the expanded AM band and experiments in digital broadcasting, it is generally true that emphasis has been on FM facilities in recent years.

AM stations have often turned into automated sister stations, operating either as an afterthought or to prevent competition.

As many markets grew in the past 20 years, some AM stations that were long-time ratings powerhouses found themselves crippled in expanding population centers where the signal did not reach. A great number of directional stations discovered that the land they sat on was worth more than the station itself.

Identifying the upgrade potential for a station or knowing how well it covers the general market area can be a major concern for station owners and possible buyers. A new computer program makes evaluation of AM station facilities easier.

The "What-if" factor

AMR, from Radiosoft, allows the user to do some "what-ifying" before committing to a large and costly engineering study. This can be helpful in several areas, such as maintaining a directional array, verifying market coverage and printing custom coverage maps. A primary use for the program is to look at what currently exists. AMR does this from several standpoints. Stations can

be located by call letters, by radius from a city location or by geographic coordinates.

Once a station of interest is located, the user selects the appropriate mode. This can consist of criteria such as day or night patterns or whether the station is licensed or under a CP. This leads the user to a graph of the station pattern.

Options allow scaling the map as well as insertion of cities, roads, county lines and even railroads and rivers.

Perhaps a sales department would like to show station coverage compared to another station, or the combined coverage of two co-owned AM stations. AMR will allow the plotting of two stations at once with both day and night patterns on the same page.

One of the most interesting mapping options is PopCount. Enabling PopCount allows the user to easily compare the coverage pattern of the station to the actual location of the population. The total population inside each of the coverage patterns is also displayed.

Instant market research

A station's comparative weaknesses or strengths can be quickly evaluated in this setting.

For group owners or program suppliers, AMR has a routine to plot the coverage areas on a U.S. map. This provides a quick way to show national penetration for a station group or a network.

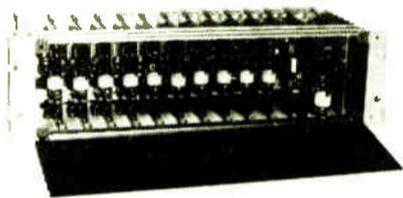
This same national map option can also be used to show all stations on a given frequency. The user is furnished with data on how stations protect one another as well as where a pattern might be

continued on page 45 ▶

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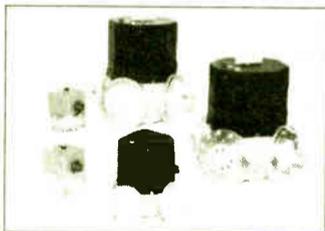
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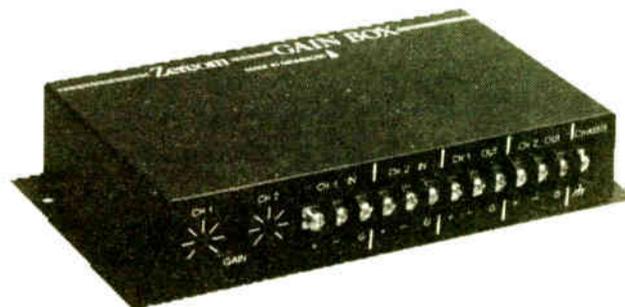
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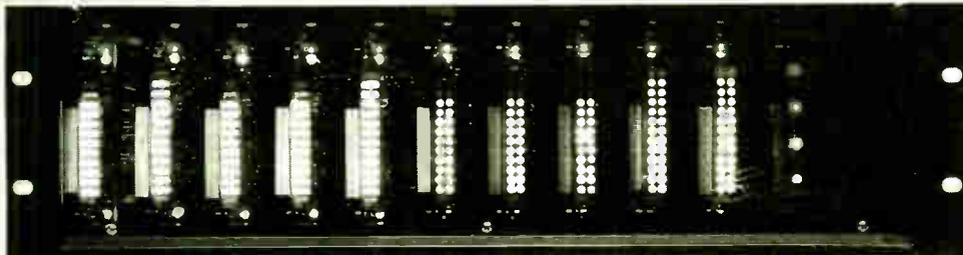
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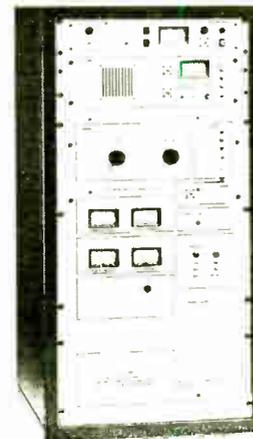


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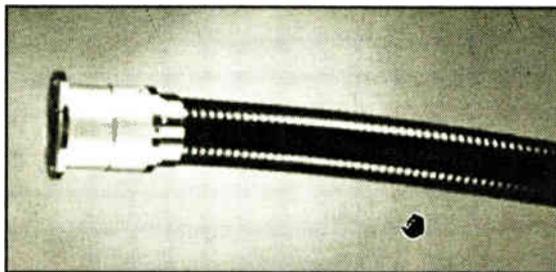


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High Power Broadcast Cable

Andrew Corp. announced the availability of its HJ9HP-50, a new 6 1/8-inch class high power coaxial cable for broadcast applications. The new 50 ohm, 5-inch air dielectric cable provides 6 1/8-inch power in a five inch package.



The cable handles more average power at every frequency than 6 1/8-inch cable, yet is smaller and easier to handle. HJ9HP-50 cable is available in exact lengths up to 325 meters (1,100 feet).

For more information from Andrew, contact the company in Illinois at 800-255-1479, extension 46; or circle Reader Service 86.

Digital Audio Source Selectors

Three new ARS series digital audio source selectors from Wohler Technologies provide signal routing with access to multiple AES/EBU digital audio signals. All of the ARS units are housed in a single rackspace cabinet.

The ARS-D81 routes one of eight inputs to a single output; the ARS-D82 selects one or two of eight inputs for two outputs; and the ARS-D161 accepts 16 digital inputs for routing to a single output.

For more information from Wohler Technologies, contact Carl J. Dempsey in California at 415-589-5676; or circle Reader Service 73.

FM Translator Diplexer

The diplexer model 7502FM(20) from Communications & Energy Corporation Inc. combines any two FM channels separated by a minimum of five MHz in the FM radio band. Channel band widths are one MHz with a maximum passband insertion loss of 1.5 dB (one dB typical) on each channel. Power handling is 25 W (maximum) and the connectors are Type N or Type BNC.

For more information from Communications & Energy Corp. Inc., contact Steve Shafer in New York at 800-882-1587; fax: 315-452-0732; or circle Reader Service 75.

More Features for DigiCenter

DigiCenter 2.0 is now available from ITC. Features on the new version include expanded networking management, audio database management tools, third party product interfaces with automated file conversions, expanded virtual console operations and new user interfaces.

DigiCenter can be interfaced to many third party products as networked workstations, allowing access to a central audio library. Audio mixing and routing with DigiCenter's virtual console and logic I/O control functions are fully integrated and external events can be selected and recorded for delayed broadcast to any station on the network.

For more information from ITC, contact Charlie Bates in Illinois at 309-828-1381; fax: 309-828-1386; or circle Reader Service 76.

DAT and Digital Cart Machine

The Model D10 DAT machine from Fostex features a planned upgrade path that will allow the end-user to customize the unit to its environment. Because of the production attributes on the D10, it can also be used as a digital cart machine.

The D10 offers a cue-to-modulation feature as well as a GPI trigger function that can be put to work when two machines are in use. Also included are shuttle, jog and ram and scrub functions and a fluorescent display that offers the choice of monitoring the remaining margin levels for each channel, reading the audio levels on the fly with numerical dB readout or reading error levels in percentage.

For more information from Fostex, contact Rick Cannata in California at 310-921-1112, extension 129; or circle Reader Service 60.

Enhanced Facilities On DAT Recorder

Otari's new DAT recorder, the DTR-8, provides enhanced facilities for recording user-entered ID characters and accessing other subcode information. An operator is able to record and subsequently



erase up to 60 characters at the beginning of each track and can view the characters on the front panel display upon playback.

Basic features on the DTR-8 include selectable sample rates of 44/48 or 1/32 kHz, high-speed search of up to 300 times play speed, active balanced analog inputs and outputs on XLR connectors and both AES/EBU and SPDIF digital inputs and outputs. Also included are rack-mount adapters, parallel wired remote control, wireless remote control and an hour meter for maintenance scheduling.

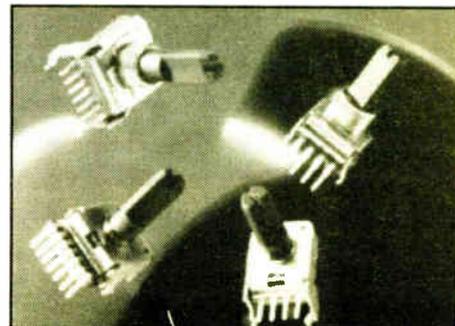
For more information from Otari, contact the company in California at 415-341-7200; fax: 415-341-5900; or circle Reader Service 102.

Rotary Potentiometers

Noble U.S.A. has announced the expansion of its XV Series rotary potentiometers to include 12 mm and 14 mm sizes. The potentiometers are specifically designed to serve as volume, tone and balance controls on professional and consumer audio equipment.

Available in 16 different styles, the potentiometers' maximum operating voltage is 50 VAC, it has a power rating of 0.05 W and a full rotation of 300 degrees.

For more information from Noble, contact Bob Burdick in Illinois at 708-364-6038; fax: 708-364-6045; or circle Reader Service 79.

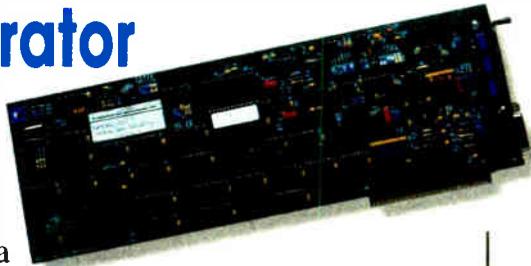


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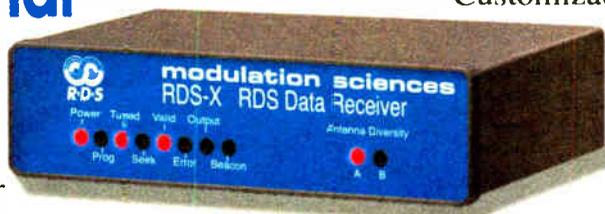
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FEEDLINE

Measure Line Impedance Properly

by W.C. Alexander

DALLAS What is the impedance of the transmission line in your AM antenna system? Fifty ohms, you say? Fifty-two? Perhaps. The nominal impedance of a given transmission line is what we usually assume the actual impedance is, but sometimes variations of as much as 20 percent can exist.

The design of a matching network or filter must assume a nominal impedance, but in the field we can determine what the actual impedance is by a simple series of measurements. We can then recalculate the leg values in our network

to match this actual impedance and truly match the load to the line.

The result will be more efficient power transfer, lower loss and better bandwidth. Multiply this several times over in a multi-element directional array and the improvements you see will have even greater significance.

Measure impedance

To measure the impedance of a transmission line, you will need an oscillator, a bridge and a detector. I use an old General Radio 1606B bridge with a Potomac SD-31 synthesizer-detector for all static impedance measurements in the

AM systems in our company. This combination is tried and true and gives accurate and repeatable results.

There are other ways of making impedance measurements, such as an impedance meter. I have seen others use an oscillator with the Delta operating impedance bridge (OIB) for this type of measurement. This setup will not be as sensitive as a low-level bridge, but using an external detector such as a field strength meter, you can use it with acceptable results.

Two measurements are all that are required to determine line impedance: a short-circuit measurement and an open-circuit measurement.

Begin by disconnecting the transmission line to be measured at both ends. With the far end of the transmission line open, measure the resistance and reactance of the line at a frequency on which the line will be close to an odd number of eighth-wavelengths long. The actual frequency does not matter except that resonant lengths should be avoided. Be sure to correct the reactance reading of the bridge for frequency.

Now, short the far end of the line and remeasure the resistance and reactance of the line, again correcting the reactance reading for frequency.

With the open-circuit and short-circuit resistance and reactance values in hand, we can plug them into the following formulas:

$$Z_o = \sqrt{Z_{sc} + Z_{oc}}$$

$$\theta_o = \frac{(\theta_{oc} + \theta_{sc})}{2}$$

Where:

Z_o = magnitude of the measured impedance of the transmission line.

θ_o = angle of the measured impedance.

Z_{oc} = magnitude of the measured open-circuit impedance.

θ_{oc} = angle of the open-circuit impedance.

Z_{sc} = magnitude of the measured short-circuit impedance of the line.

θ_{sc} = angle of the open-circuit impedance.

Z_{oc} , θ_{oc} , Z_{sc} and θ_{sc} are computed using the following formulas:

$$Z_{oc} = \sqrt{R_{oc}^2 + X_{oc}^2}$$

$$\theta_{oc} = \arctan \left(\frac{X_{oc}}{R_{oc}} \right)$$

$$Z_{sc} = \sqrt{R_{sc}^2 + X_{sc}^2}$$

$$\theta_{sc} = \arctan \left(\frac{X_{sc}}{R_{sc}} \right)$$

Here is an actual example that I ran in the field recently. The line was a 1,025-foot length of Cablewave FLC 38-50J foam-dielectric sample line. I had just finished measuring the resonant frequency of the line (to determine its exact electrical length). While I had the bridge and synthesizer/detector connected, I decided to see what the impedance of the line was. Open-circuit, the line measured 8.8-j4.5Ω; short-circuit, it

continued on page 43 ►



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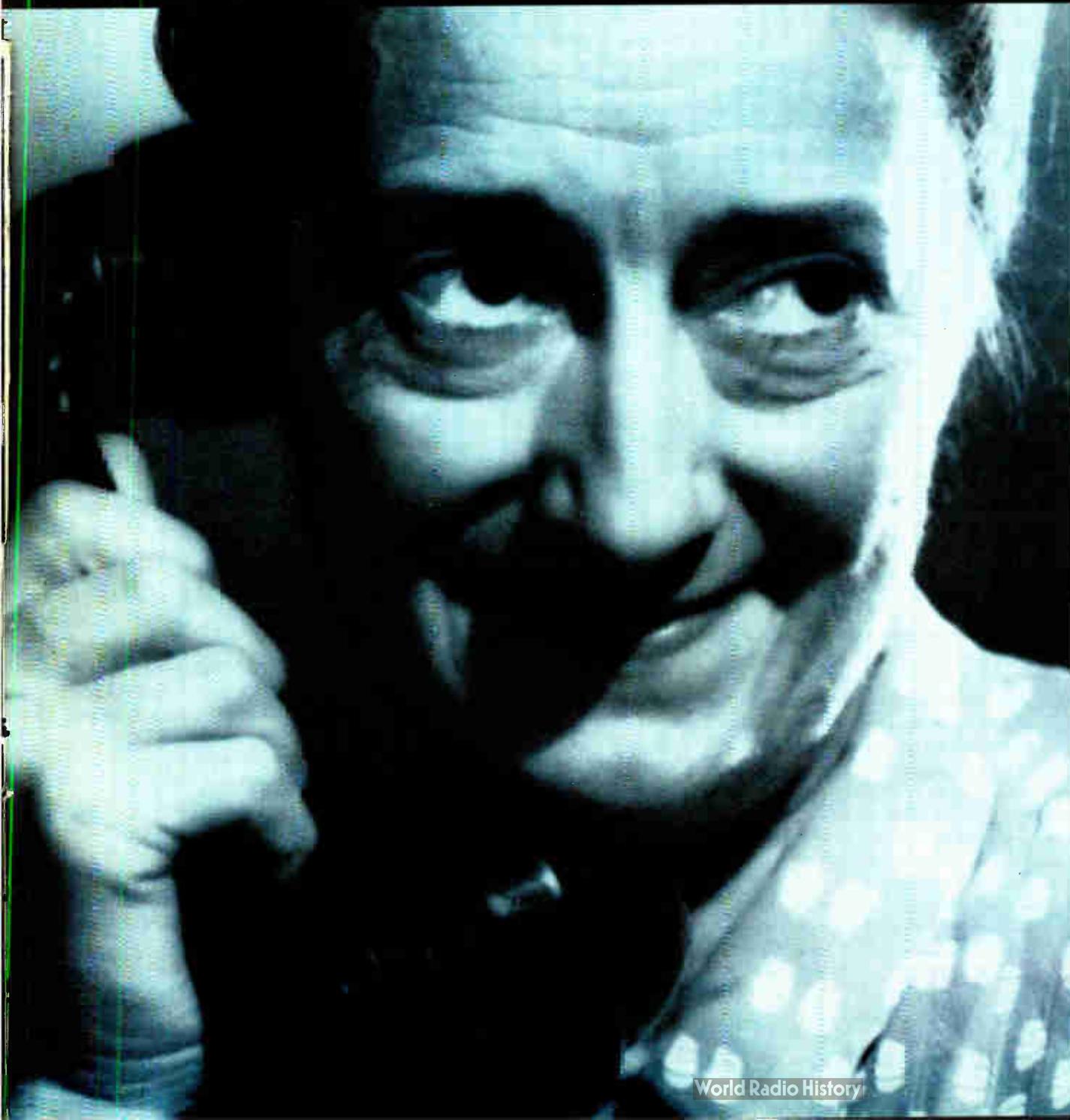
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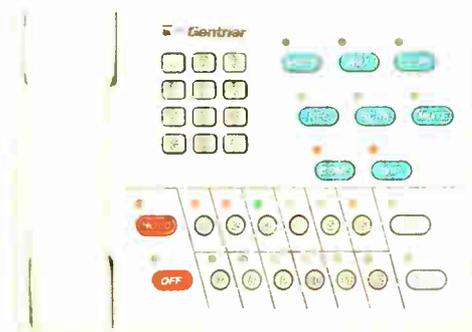
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John Holt's Historic Microphones

by Alan R. Peterson

WASHINGTON What production director would turn down a mic collection like this for his or her studio?

Rather than choose between a Neumann U84 or an EV RE20, imagine a classic RCA 77DX with all that heavily-polished chrome and warm "ribbony" sound.

Or how about a Western Electric 618 for that Japan-surrenders-aboard-the-USS-Missouri ambience?

Meet John Holt. He collects those beautiful old mics.

Holt is assistant director of technical services for WAMU-FM, the public radio station for The American

University here in Washington.

Since 1966, he has enjoyed collecting rare and vintage microphones. Some of the mics reside at home, others at WAMU.

As he puts it, "I began back in high school with an American D9 microphone I bought for around five dollars. I was getting into broadcasting and I just liked mics."

Magnificent mics

His penchant for old-time mics has netted him an impressive collection, including a few units you never see anymore.

For example, an entire trio of mint condition RCA 44 ribbons.

"RCA made the 44A, 44B and the 44BX," Holt said. "There are differences in impedance and machining and some cosmetic differences too."

Indeed, each mic he displayed had different connectors, different bases and variations on the art deco "racing stripe" design RCA carried on most of its products.

Holt also pointed out the nearly invisible differences between versions of the same basic mic.

"This mic was a 'Minneapolis' 44, from the days when CBS owned WCCO (AM)," he said. "You can tell by the connector in the back, which goes straight down. The 'New York' CBS mic had an angled connector, which allowed the mic to be tilted in a wider arc."

Serial numbers tell a story too. According to Holt, "RCA sold so many mics to the networks they included the letter 'C' for CBS or 'N' for NBC within the serial numbers."

On the bench

All during this exposition, a classic 1920s vintage Western Electric carbon button "watch case" mic was plugged in on his bench at WAMU.

More than just a mic, this was a fine example of the mic. This style of microphone was present at the historic Harding-Cox election report over KDKA(AM) Pittsburgh in 1920.

Holt had his connected to a Fluke digital oscilloscope, power supply and matching transformer. A dot matrix print-

er positioned near the mic created a spiky trace on the scope every time a line of figures was put to paper.

"This is actually a double-button mic," Holt explained. "The single-button carbons had a nice peak at 5 kHz, but two carbon buttons flattened out the peak and widened the response of the mic."

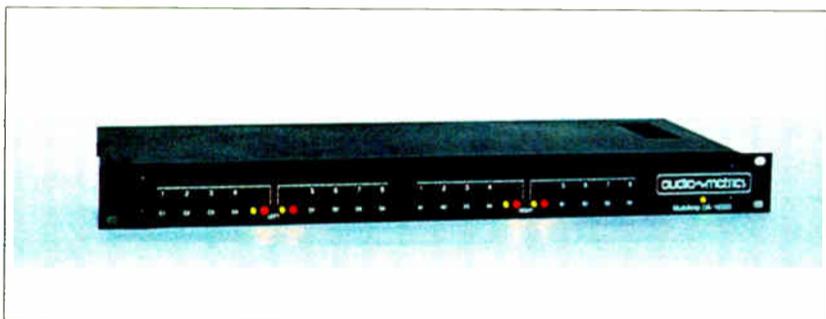
One could envision a young announcer or seasoned pro standing before this distinguished old microphone, reading from a dramatic script or reporting the news from the pioneer days of radio.



John Holt and his mic collection.

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OFFBEAT RADIO

Micro-station Airs Eclectic Show

by Dee McVicker

PHOENIX If you wanted to take the train to, say, Georgetown, but all the lines were going to Union Station, wouldn't you want to find another means of transportation?

There is a similar line of thought running through the radio market in Indianapolis, Ind., where one programmer is pursuing alternative routes to get his program out to the local listener — even going as far to air it on bootleg, unlicensed stations.

It is not as if Scott Millsop, producer/director/writer for Roadside Attraction,

hasn't tried to get local stations to pick up his eclectic radio show. And it's not as if Roadside Attraction isn't professionally produced.

It started up in February with 30-year radio veteran Al Stone, who at one time programmed Indianapolis' number-one radio station. Regulars now include such heavyweight musical talent as Pat Webb, who shared the stage with Bob Dylan; and C.J. Watson and Camille Schmidt, who opened for Black Oak Arkansas, Humble Pie, and other noteworthy bands.

The program's music is locally distinct, with some folk, blues and what is com-

monly called Americana, or acoustical country. The skits, put on by a cast of almost 20 people, many of whom come from a radio show that played locally for several years, are offbeat. And, for the most part, "Roadside Attraction" is witty and entertaining. A sample:

"Attention tourists and travelers, you have entered the event horizon of the Roadside Attraction Radio Network. ... Get ready to stretch your comfort zone and shake the kinks out of your imagination. We'll entertain you with stories and songs, a giant ball of twine, a 2,000-pound groundhog and the last really tough-minded thinking for 200 miles."

Nonetheless, few in Indianapolis have heard the show, even though Millsop has tried just about everything to get it on a local station. For several months, the program syndicated on the Fine Arts Network so public stations nationwide could pick up the feed, including Indianapolis' own WFYI-FM.

But Douglas Dillon, the general manager for WFYI-FM, said he was not interested in carrying the program, even though Indianapolis' Nuvo Newsweekly printed a favorable review. So smitten was the writer with the show, he asked readers to call the local public station and request that it run the program.

To date, "Roadside Attraction" has not attracted the interest of WFYI-FM.

However, the Nuvo Newsweekly article did lead the "Roadside Attraction" folks to the Broadripple Channel, a 10th-of-a-watt station that runs unlicensed, arguably legally or illegally, depending on one's interpretation of Part 15 of the FCC rules concerning hobbyist broadcasting. Its operator said his unlicensed station is not interfering with licensed stations in the area, and that based on the channel's field strength measurements — which he claimed adhere to Part 15 requirements — he is within his legal right to broadcast.

Indeed, the Broadripple Channel is one of five such stations that have cropped up on the Indianapolis FM band over the past few months, a trend that its operator said

continued on page 47 ▶

Calculating Impedance

▶ continued from page 40

measured 189+j202Ω. Plugging these values into our formulas, we find that this particular 50-ohm sample line actually has a characteristic impedance magnitude of 52.3 ohms. This isn't too bad. I have measured nominal 50-ohm lines with as low an impedance as 43 ohms and as high as 60 ohms. That is quite a variation!

The angle component of the line's impedance can tell us something about the condition of the line in addition to the magnitude component. In the case of the example I just cited, the angle is 9.9 degrees. If the angle component is high (say, anything over 20 degrees), there may be a defect in the line causing it to have a high reactance.

A perfect line would have a purely resistive impedance, but in the real world we almost always see some reactance. A low-angle component of the impedance value is sufficient to tell you that the line is probably OK. Likewise, a high angle should be a clue that there is a problem. Other means, such as a time-domain reflectometer (TDR), would then be employed to locate the fault.

Now, let's move on and make some additional calculations using our open- and short-circuit impedance values. The following series of equations gives us K, A, B and D:

$$K = \sqrt{\frac{|Z_{sc}|}{|Z_{oc}|}}$$

$$B = K \sin\left(\frac{\theta_{sc} - \theta_{oc}}{2}\right)$$

$$A = K \cos\left(\frac{\theta_{sc} - \theta_{oc}}{2}\right)$$

Where:

K = magnitude portion of the impedance

A = real component of the impedance

B = imaginary component of the impedance

Using the results of these calculations, we can compute the attenuation of our transmission line using the following formulas:

$$D = \frac{2A}{1 + K^2}$$

$$L = 5 \log_{10} \left[\frac{1 + D}{1 - D} \right]$$

Where:

L = loss of the entire line in dB

In our example, the attenuation computes to be 1.4 dB at the frequency

measured. This is useful in determining if the line's actual loss is close to the rated loss as determined by the manufacturer. If the measured loss is very far off the manufacturer's rated loss for a given length and frequency, make the measurements again and recalculate. If the results are the same, there is likely a fault in the line.

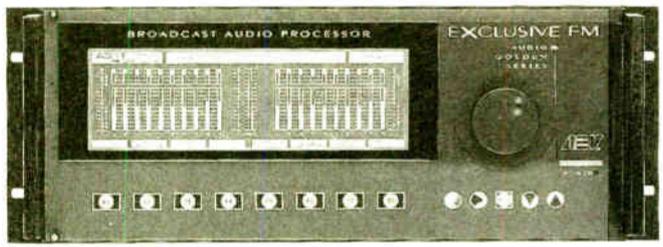
Electrical length

To determine electrical length, use the following formula:

continued on page 48 ▶

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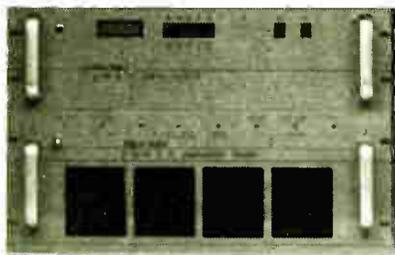
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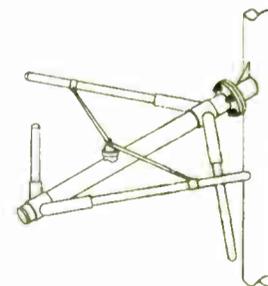
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► continued from page 36
out" to cover growth areas.

Because AMR is designed to evaluate the pattern in its basic development, there is a 3-D look at the radiation from the side or above the array. This helps identify expected field strengths, or difficult patterns due to skyway problems caused by angular radiation.

Engineers will be interested in an M3 overlay and the ability to take directional array parameters and manipulate them to observe pattern changes. This could be used to check whether simple adjustments might bring a troublesome monitor point into limits. Trying such adjustments on the computer before actually performing them can save time and hassles.

For additional information on AMR, call Peter Moncure at Radiosoft in Edgewater, Fla., at 904-426-2521.

Perhaps you have downloaded the RealAudio program for your Internet

browser and have gone out surfing the many radio stations and program sources being distributed.

The speakers built into most computers are generally useless for any sort of quality listening. Getting decent add-on speakers can be a real pain. Reasonably-priced speakers often do not sound very good or cannot provide the power to do the job.

If you are looking for some add-on speakers, you might wish to try Media Depot's SSS-170W SurroundSound system.

Running 10 W per channel, these 3-inch full-range speakers might be just the thing to make your computer sing to you.

If you are in a creative mode, Media Depot also has a new Media Mouse. Moving this rodent can generate all sorts of sounds.

For more information, Media Depot can be reached at 909-629-2597.

As many of you consider upgrading to Windows 95, you may wonder if it is worth the effort to install it.

Despite all the Microsoft-bashing from various quarters, Windows 95 is a good, stable successor to Windows 3.1 for many users.

The most important tip I can offer you is to get more memory. The absolute minimum for Windows 95 is 8MB.

You might want to consider one of the following aftermarket books designed to help you get up and running.

Microsoft Press' new book "Upgrading to Windows 95 Step by Step" will answer many of your questions as you navigate your way. A diskette of practice files helps you get the most from Windows 95. Sams Publishing has released "Teach Yourself Windows 95 in 24 Hours." As you move through various modules, the book provides tips and offers questions and answers highlighting what you want to accomplish.

Cue Books covers the spectrum from beginners to advanced users with a couple of new books. "Easy Windows 95" comes filled with full-color menu photos and walks you through all the setup options. Especially helpful are the frequent "why would I want to do this?"

explanations of the different features.

For the power user in the house, Cue's "Special Edition Using Windows 95" goes into great detail on every part of the program.

Included is a CD-ROM with over \$650 of add-on software, including Internet tools and graphics programs for maximizing the multimedia aspects of Windows.

□ □ □

Barry Mishkind can be reached at barry@broadcast.net via the Internet. Check out his home page at <http://www.broadcast.net/~barry/> or contact him by phone at 520-296-3797.

E-Mail Update

Here are some valuable e-mail addresses you will want to clip and save.

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-Barry Mishkind



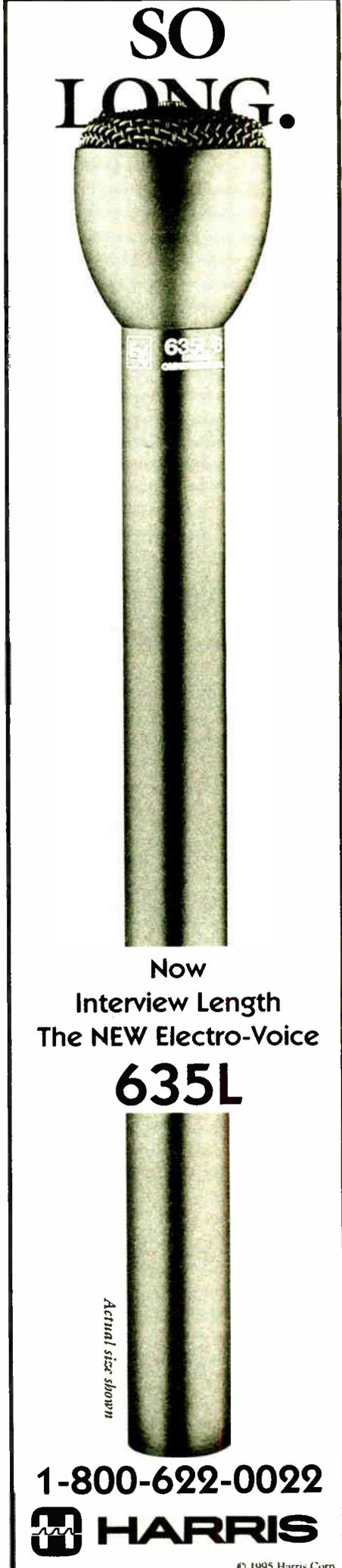
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CIRCUIT THEORY

Analysis with Thevenin's Theorem

by Harold Hallikainen

SAN LUIS OBISPO, Calif.

In the first few parts of this series, we used "differential Ohm's Law," Kirchoff's Current Law, Kirchoff's Voltage Law, node voltage analysis, and mesh analysis to analyze a simple three-resistor circuit (Figure 1).

This time we will use Thevenin's Theorem to simplify the circuit, which cannot be analyzed by Ohm's Law by itself, down to something that can be analyzed using Ohm's Law. We will also look at a

couple of ways to analyze a Wheatstone Bridge circuit using Thevenin's Theorem.

In doing research for this article I found hundreds of books that discussed the application of Thevenin's Theorem, but very little about its origin.

I did find that Thevenin's Theorem was apparently first published by Herman Von Helmholtz (1821-1834) in 1853. Helmholtz

(whose current is proportional to the applied voltage) and independent sources can be replaced with a single voltage source with a single-series impedance for analysis.

This Thevenin equivalent can replace the original complicated subcircuit in the original circuit. The use of the equivalent circuit

in Figure 1 (replacing V_1 , R_1 and R_2). Other equivalents are possible, but care must be taken that you do not replace too much of the circuit with the equivalent, leaving points of interest "inside" the equivalent where they are not available for analysis. Figure 2 shows the circuit we wish to

"Thevenize." Figure 3 shows how it has been replaced by a single "Thevenin voltage" and a single "Thevenin resistance."

To determine the Thevenin voltage, take the original circuit for which the equivalent is desired (Figure 2), and place an "imaginary voltmeter" across the two terminals that connected this subcircuit to the remainder of the circuit. In this case, we measure the voltage at the junction of R_1 and R_2 with respect to ground. This "open circuit voltage" is the Thevenin voltage. In this circuit, it

continued on next page ▶

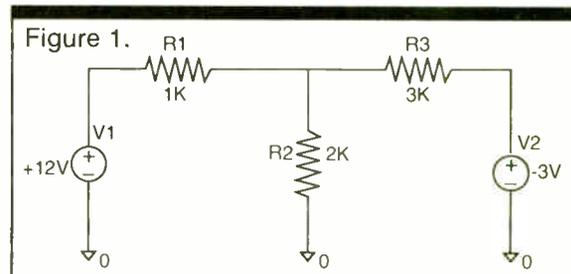


Figure 1.

should simplify (or make possible) the analysis of the original circuit. It should be noted that the equivalent circuit is only equivalent outside the equivalent. You cannot make efficiency calculations of the original subcircuit based on its equivalent.

Let us find the Thevenin equivalent of the "left half" of the circuit

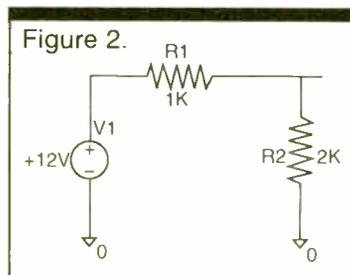


Figure 2.

was a German scientist who worked in a wide variety of sciences. He was originally trained as a doctor since the German government would pay for his training if he would then serve in the military.

One reference stated, "Helmholtz was the last scholar whose work, in the tradition of Leibniz, embraced all the sciences, as well as philosophy and the fine arts." I was unable to find a translation of his original stating of this theorem.

M.L. Thevenin (1857-1926), a French telegraph engineer, again discovered the theorem in 1883 (see *rendus hebdomadaires de seances de L'Academie des sciences*, XCVII, 159 (1883), excuse my French!).

Finally, I also found a reference to it as the Thevenin-Pollard theorem. And, in 1926, E.L. Norton of Bell Telephone Laboratories replaced the voltage sources in the Thevenin (or whoever) equivalent with current sources to come up with the Norton equivalent. We will look at Thevenin equivalents this time and Norton equivalents in a later article.

A circuit containing linear devices

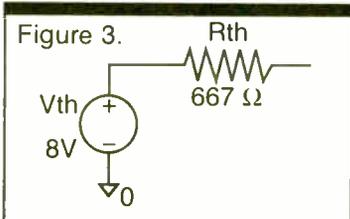


Figure 3.

Vintage Microphones

▶ continued from page 42

belonging to the RCA 77 series. Holt owns several.

"These mics are pure simplicity," he said. "A ribbon of corrugated aluminum, suspended inside a magnetic field and connected to a step-up transformer. The resonant frequency of the mic is controlled by physically stretching the ribbon."

What of the fragility and less-than-pristine sound of old ribbon mics?

Holt said, "I have seen 77s with flat heads caused by their being dropped on end from above. The impact stretches the ribbon and this causes the low-end response to drop even lower. Unfortunately, when you extend the low end of a 77, you lose the high end."

This becomes the audible part of the damage: a ribbon mic with no highs. According to Holt, a quality mic needs to be re-ribboned every five to 10 years, even with proper care.

"Clarence Kane is the man to call for repairing old ribbons. He used to do it for RCA. Now he repaints the shells, replaces fabric screens and redoes the ribbon. Anyone who needs him knows him."

His Western Electric 618 dynamic mic is another fine classic. With a genuine silk popscreen and an artistically-turned pedestal, Holt's 618 seemed to be styled more as a table lamp than a microphone.

This mic was meant for serious connectivity, too. Pulling the connector off the back,

Holt revealed an oversized set of contacts robust enough to handle 20A of current.

At a time in audio history where CD quality is the rule, can these classic microphones find any use beyond recreating the glory days of radio?

Holt explained, "It depends completely on what you are recording. From its inception, the RCA 44 was meant to be a full-fidelity recording microphone. Its 50 Hz to 15 kHz response certainly qualifies it for even FM broadcasting.

"There are people who swear by ribbon mics for recording horns and brass instruments. Unless there is an essential need to go up to 20 kHz and pick up the harmonics that high, a good ribbon mic is all right," said Holt.

Holt's classic microphones have been in demand. In addition to the Navy display, one of his 77s was used in taping "A Prairie Home Companion" for the Disney Channel. His entire collection was pressed into use for WAMU's "The Big Broadcast." And while sources for classic mics are becoming scarce, Holt is still looking.

"They have become tough to find in the past three or four years," he said, "and I check the RW classifieds, too. The old local 250 W townie stations used to have back closets filled with 77s and 44s."

But those too, are becoming as scarce as the mics John Holt continues to look for.

was easily determined using Ohm's Law or using the voltage divider formula ($12V \cdot (2K/3K) = 8V$).

To determine the Thevenin resistance (or, in AC circuits, the Thevenin impedance), replace all independent voltage sources with zero volt sources (a short) and replace all independent current sources with zero amp sources (an open). Place an "imaginary ohmmeter" the same place we put the voltmeter above. In this case, the shorting of V_1 puts R_1 in parallel with R_2 , yielding a Thevenin resistance of 667 ohms. The Thevenin equivalent

of Figure 2 is shown in Figure 3. Figure 4 shows the original circuit with V_1 , R_1 and R_2 replaced by their Thevenin equivalent.

We can apply "differential Ohm's Law" to the circuit of Figure 4 to determine circuit characteristics.

First, we establish the direction of conventional current, which "flows downhill," from high (more positive) voltage to low (less positive or more negative). Here, the conventional current flows to the right. We can then determine that current using $I = (V_{tail} - V_{tip})/R$. V_{tail} is +8 volts, while V_{tip} is -3

volts. R is the series combination of R_{th} and R_2 : 3.667K. The current is 3mA.

Using Ohm's Law, we can determine the voltages across R_{th} and R_2 , as shown in Figure 5. To determine the voltage at the junction of R_{th} and R_3 , we can start at the right side of R_3 , which is at -3 volts due to V_2 , then "go up" 9 volts as we pass through R_3 to the left. This puts the junction at +6 volts, as shown. We could also start at the top of V_{th} (+8 volts) and go down 2 volts as we go to the right through R_{th} . Again, we get +6 volts.

Once we know the voltage at the left end of R_3 , we can drop this information into Figure 1 and determine any other desired currents. Note that this determination agrees with our previous calculations using node voltage analysis, mesh analysis, and superposition.

Next time we will try applying two Thevenin equivalents to the Wheatstone bridge. Your homework assignment is to find out who Wheatstone was, and why he got a bridge named after him.

□□□

Harold Hallikainen is president of Hallikainen & Friends, a manufacturer of telemetry and control equipment for the broadcast industry. He also teaches electronics at Cuesta College and is an avid contra dancer. He can be reached at 805-541-0200 (voice), 805-541-0201 (fax), E-mail at hhallika@slonet.org or on the World Wide Web at <http://slonet.org/~hhallika/>

Low Power Radio Show

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few months, a trend that its operator said could soon happen all over the country as people tire of the one-size-fits-all programming typical of today's public station.

"I love classical music, but that's not my idea of public broadcasting," he said. "If I'm not mistaken, the FCC allotted those frequencies (below 92) for the avant-garde, for the cutting edge. And those stations, generally speaking, across the country are more conservative in their programming than the ones above 92.

"All along the FCC has said frequencies are precious, and we're going to dish them out very fairly," he said. Then duopolies came down and then megapolies, or whatever you want to call it where one owner can own half the stations in the city. (There are) people like my group who want to get a frequency for our own community, and we can't get one."

The Broadripple Channel was formed after years of failed attempts to acquire a frequency in Indianapolis for a nonprofit, community station that would feature local artists. It gets out about a mile within an area known as Broadripple.

"Roadside Attraction" started airing on the Broadripple Channel soon after the Nuvo Newsweekly article appeared.

"It's a very well produced program," noted the microstation's operator. "It's almost on par with Garrison Keillor's, and the local station turned it down. Where is the public

here? This isn't a bunch of local kids getting together and producing a show. This is a show with professional musicians," he said, arguing that hobbyists broadcasting under Part 15 offer a local service currently not being addressed by other public stations.

Another point he makes is that if the commission had been more judicious with allotting power, local markets would be better served by broadcasters.

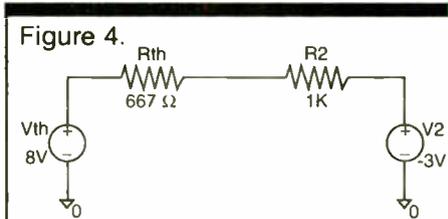
"Why do we need a station in Indianapolis that covers Lafayette, Indiana?" he asked. "What with satellite feeds ... there's no need for Indianapolis to have 10 radio stations that are anywhere from 5,000 to 50,000 watts. Why do we need to cover Lafayette and Bloomington and cities that are 30 to 40 miles away? Let them have their own radio stations."

Millsop said he too is concerned about the lack of local presence in public broadcasting. "Roadside Attraction" has national appeal, he said, but it is the local market that gives this program and others like it their authenticity.

Regardless, he plans to continue taking "Roadside Attraction" on the road to other markets and other alternative outlets, including cable radio and even to the Internet.

□□□

Dee McVicker is a freelance writer and regular contributor to Radio World. She can be reached at 602-545-7363, or via e-mail at roots@primenet.com



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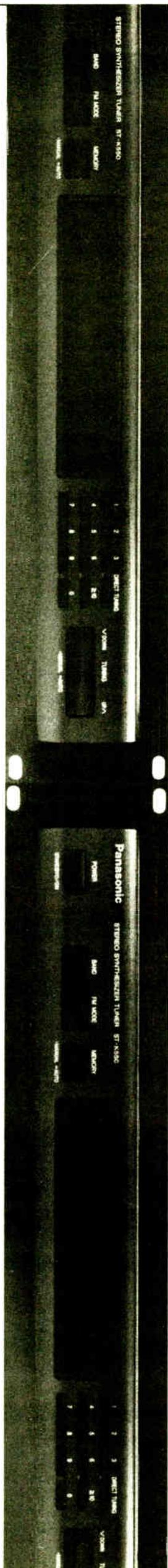
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► continued from page 43

$$G = \frac{2B}{1 - K^2}$$

$$Bl = \frac{\arctan G}{2}$$

Where:

Bl = distance of the end of the transmission line, in electrical degrees, from the nearest quarter-wavelength at the frequency measured.

In our example, we find that we are -6.64 degrees to the nearest quarter wavelength. In other words, if our line were 6.64 degrees longer at the frequency measured, it would be a whole number of quarter-wavelengths long. I made my measurements at 1,000 MHz, so knowing that five times 1/4λ at that frequency is 1,230 feet (the next 1/4λ point to the known 1,025-foot physical length), we can subtract 6.64 degrees at 1 MHz or 18.15 feet and find that our transmission line is 1,211.85 feet long. Dividing the known 1,025 feet physical length by the measured 1,211.85-foot electrical length, we find that the measured velocity factor is 84.5 percent — not far off the manufacturer's rated 85 percent.

With a couple of simple bridge measurements and a pocket calculator, we have learned a lot about our transmission line. In the case of our example, we have found that the characteristic impedance, attenuation and velocity factor are all close to the manufacturer's specifications.

Had this been a power-carrying line feeding a tower, I would have re-computed the leg values of the tee- or L-network matching the load to the tower to specify 52 ohms rather than 50 ohms on the input side. While leaving the network adjusted for 50 ohms on the input leg would result in only a 1.04:1 SWR at that point, every little bit counts.

If you are in the process of building, evaluating, rebuilding, repairing or optimizing an AM antenna system or array, I recommend taking a few minutes to make open- and short-circuit measurements on each line in the system, even the sample lines. The information you receive from this easy test will tell you a lot you did not know about your system and may save you time, money and trouble in the future.

□□□

Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. Reach him at 214-445-1713.

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Neve, API, MXR mic pres, EQs, effects, compressors. T Coffman, 619-571-5031.

AUTOMATION EQUIPMENT

Want To Sell

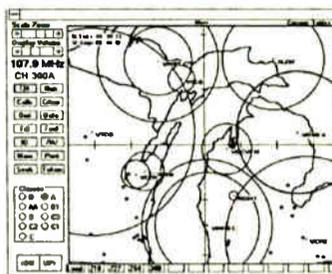
IGM-EC complete automation system in gd cond w/3 stereo Instacart 49's, 1 stereo Go-Cart 24, computer, interfaces manuals & cables, currently in use. C Mandel, KWST, Box 1018, El Centro CA 92244. 619-352-2277.

IGM-EC automation system w/8088XT, SMC 350 Carousels w/72 cart capacity w/Shaffer controllers & monitor amps, gd cond, \$3500. 503-223-6769.

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Sentry FS-12B complete automation system in gd cond w/2 stereo 48 instacart, 4 stereo Go-Carts, (2) 24's, (1) 48's & (1) 42, computer, interfaces, manuals & cables, currently in use. C Mandel, KWST, Box 1018, El Centro CA 92244. 619-352-2277.

Sola transformer, 208-250 Volt to 118 Volt; Ampex PB amp/speaker, suitcase style, tubes; enclosed switch 100 amp 3-pole, BO. R Wells, KSRO, 1410 Neotomas Ave #200, Santa Rosa CA 95405. 707-543-0146.

Harris 9002, ITC, R-R, Carousels, floppy drive back up, \$1500. T Bescata, WAQE, 2293 19th St, Rice Lake WI 54868. 715-234-9059.

Smartcaster Best Teck 3 (1991), full satellite interface & digital prod, in full working cond, \$3500. D Fitzgibbons, WARE-AM, 100 Foster St, Southbridge MA 01010. 508-764-4381.

SMC MSP automation system, works great, SMC racks (3), 452 bi-directional Carousel, (2) ARS 1000 reels, (3) single cart PB, (2) 25/1000 Hz tone generator, battery backup, silence sense, manuals, very clean, \$2000 you pick up in VA. H Espravnik, Magnum Comm, 615-230-3618 or 615-452-3983.

Systemation Satfire satellite hard disk automation; SMC DP-2 automation system with 4 Carousels, 5 reel decks, dual PB cart, will part out. C Springer, KLMR, POB 890, Lamar CO 81052. 710-336-2206.

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ITC triple deck w/record module (stereo), like new, \$1200; BE triple deck w/record module (stereo), gd cond, \$1000; (2) Omega single play machines in gd cond, \$500 ea. Dave, KDEA, 318-267-7523.

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ITC SP stereo play, 3 tones, \$450; Tapecaster 701P mono play, \$250, or both for \$550, both in excel cond w/manuals. Ken Lamson, 510-447-7405.

Tapecaster 500A, \$75; Tapecaster R/P, \$85. W Moring, WSCI, 2187 Wappoo Dr, Charleston SC 29412. 803-795-9401.

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ITC record amps, 3 tone, stereo \$350 or mono \$250. W Gunn, 619-320-0728.

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Denon DN970FA Demo cart CD player \$1350.00/ea. 1 available. Call 1-800-622-0022.

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Radio Systems RS-18, 18 channel stereo console \$7550.00/ea. 4 available. Call 1-800-622-0022.

Ampro AL-10D 10 channel, ea has 4 aux inputs, dual channel mono out, self contained power supply & monitor amp, manual, very good condition, \$425. D Nuechterleiw, WUCM TV 19, A-93 Delta College, University Ctr MI 48710. 517-686-9341.

Sound Tech ST 164 16x4 mixing board, like new, \$1100. D Huettner, Dynamic Sound Studio, 358 W Bell St. Neenah WI 54956. 414-722-7228

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Gates/RCA Executive President BC7-A solid state, Gates Executive 10 channel stereo & a Gates President 10 channel mono, both in mint condition, \$200-750. F Roberts, KUT-FM, CMB 3.142 Univ of TX, Austin TX 78712. 512-475-9069.

Autogram AC-8: BE 5S-150, excel cond. Phil, KMXZ, Hollister CA. 510-895-6358

Gates M5133 Gatesway console, working when removed, spare power supply & manual, \$300. D Wilkerson, WLIK, 640 W Hwy 25/70, Newport TN 37821. 423-623-3095.

Gates Dualux, tube type, worked when removed, manual, \$600 C Buckley, KXO, 420 Main St, El Centro CA 92243. 619-352-1230.

Harris Gates Yard II 8 chnl mono board, solid state, needs work BO. D Nuechterleiw, WFLT, 6130 S Dehmel Rd, Frankenmuth MI 48734. 517-652-6863.

Langevin AM-301, 12 mono inputs, stereo output, cue buss, effects buss, BO/trade. R Wells, KSRO, 1410 Neotomas Ave #200, Santa Rosa CA 95405. 707-543-0146.

McMartin B-1082 8-channel stereo, 18 inputs with manual, excellent condition, \$750. R Rocks, KEMC, 1500 N 30th St, Billings MT 59101. 406-657-2941.

Quantum 12-P, 6 stereo inputs, 6 mono inputs, 4 output busses, cue detents, buss & amp, very good condition, some noisy switches, \$2000/Best Offer. R Wells, KSRO, 1410 Neotomas Ave #200, Santa Rosa CA 95405. 707-543-0146.

Shure mixer, \$600, 2-line Comrex, \$2100. T Balistreri, 414-784-2863.

McMartin 8 pot, gd cond, \$650.00. J Arzuaga, WREI, Clemont FL. 809-895-2725.

Ramko DC5AR, 5 channe, mono. J Parsons, Parsons Sounds, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

Soundcraft Delta Series modular 16x4x2 mainframe with (6) mono mic line, (6) stereo line, (4) sub out, master out modules, 4 years old, good condition, \$2000 +shipping. T Stine, KCGO, POB 2077, Cape Girardeau MO 63702. 314-335-9099.

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CBS Audiomax 4440A & Volumax 400, mod compressor/limiter & peak limiter, BO. D Nuechterleiw, WFLT, 6130 S Dehmel Rd, Frankenmuth MI 48734. 517-652-6863.

Orban AM9100B Optimod, perfect cond, NRSC, manual, key, adj tool all included, \$3000/BO. S Allen, WHNR, 1505 Dundee Rd, Winter Haven FL 33884. 941-299-1141.

Orban Optimod 8100A AXT2, never used, \$750. Dave, KDEA, 318-267-7523.

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Audiomax 4440-A compressor, \$125; Volumax 4000-A compressor, \$125. T Coffman, 619-571-5031.

Optimod 8000A limiter/stereo gen. Phil, KMXZ, Hollister CA, 510-895-6350.

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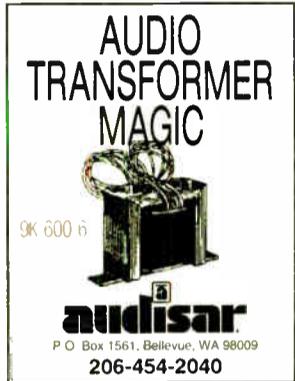
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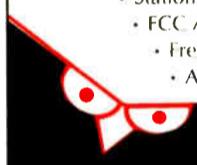
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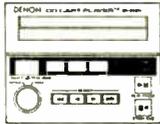
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Jackson CRO-3 tube type oscilloscope, BO. D Neuchterlew, WUCM TV 19. A-93 Delta College, University Ctr MI 48710. 517-686-9341.

Narda 25223 directional coupler 1.7 to 4.2 GHz w/20 dB tap, \$35; Kay 154C sweep gen (delux) 0-110 MHz less marker plug in vgc, \$130. J Cunningham, KEOB, Rt 2 Box 113B, Stonewall OK 74871. 405-265-4496.

Tektronix 5440 oscilloscope dual trace w/5A48 vertical amp & 5B42 delay time base, 50 MHz, gd cond, \$550. B Lindahl, Lindahl Studios, 10680 SW Wedgewood, Portland OR 97225. 503-644-9643.

B-K E-2000 solid state RF signal gen, \$20 +shpg. E Lightman, WEDL, 550 Merchant St, Ambridge PA 15003. 412-266-2802.

Potomac Instruments AA-51 & AG-51 audio test & measurement set, excel cond, all accessories, BO. J Seamna, PBS, 1320 Braddock Pl, Alexandria VA 22314. 703-739-5483

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McMartin AM-25 AM noise meter. R Sweatle, POB 7172, Kennewick WA 99336. 509-586-8627 phone/fax.

TRANSMITTERS

Want To Sell

Harris SX-1, Sintronic 3.5K, 419-782-8591.

Gates BC1-J AM xmtr, operating & in gd cond, will put on your freq, \$2500. J Cunningham, KEOB, Rt 2 Box 113B, Stonewall OK 74871. 405-265-4496.

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Gates BC1F 1000 W w/new 3100 V power transformer, silicon rectifiers & many spare parts, BO. S Sharpless, WPHB, RR 1 Box 38, Philipsburg PA 16866. 814-342-2300.

GE FM BTA3 for parts, BO. J Whalley, WNUZ, 110 Glenhaven Dr, Alexander City AL 35010. 205-234-2492.

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Harris Gates FMSG 5000 W xmtrs, \$5000. G Quinn, WMRS, 132 N Main St, Monticello IN 47960. 219-583-8933 or 513-399-7250.

Henry 100D-95 100 W amp, new in box/never used, tuned to 100.1 MHz, \$950/BO. D Michaels, KZRO-FM, POB 1234, Mt Shasta CA 96067. 916-926-1332.

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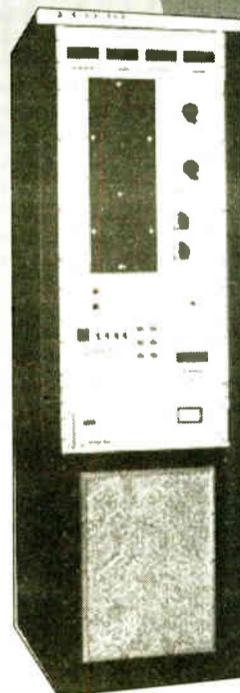
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Gates 250-GY 250 W AM w/solid-state rectifiers. C Frodsham, KVSU, POB 7, Beloit KS 67420. 913-738-2206.

Harris 3.5 FM, 3 yrs old, parts, (2) chokes, filter, transformer, PLT, BO, B Carr, WYHK, 1201 Fremont Pk, Woodville OH 43460. 419-837-9696.

Henry 1000D 1 kW FM xmtr, new, tuned to your freq, \$16,000; Collins 310Z1 exciter, less PA module, BO, Phil, KMXZ, Hollister CA, 510-895-6350.

Sparta 1.5 kW FM xmtr w/exciter & stereo gen, \$4600. J Arzuaga, WREI, Clemont FL. 809-895-2725.

Harris-Gates FM-10H3 w/new exciter in vgc, some spares; Harris FM-20H3/K mods w/new exciter in gd cond, some spares; ERI FMS-12 bay high pwr cycloid style CP antenna w/400' Andrew 3" heliax 90.5 MHz priced to sell. Call 816-628-5959.

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McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

TUBES

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ATTENTION ADVERTISERS! Take note of these UPCOMING DEADLINES: Deadline for January 10, 1996 issue - December 15. Deadline for January 24, 1996 issue - December 29. Radio World logo.

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Table with 4 columns: Page No., Advertiser, Reader Service No., and Advertiser. Lists various companies and their corresponding page numbers and reader service numbers.

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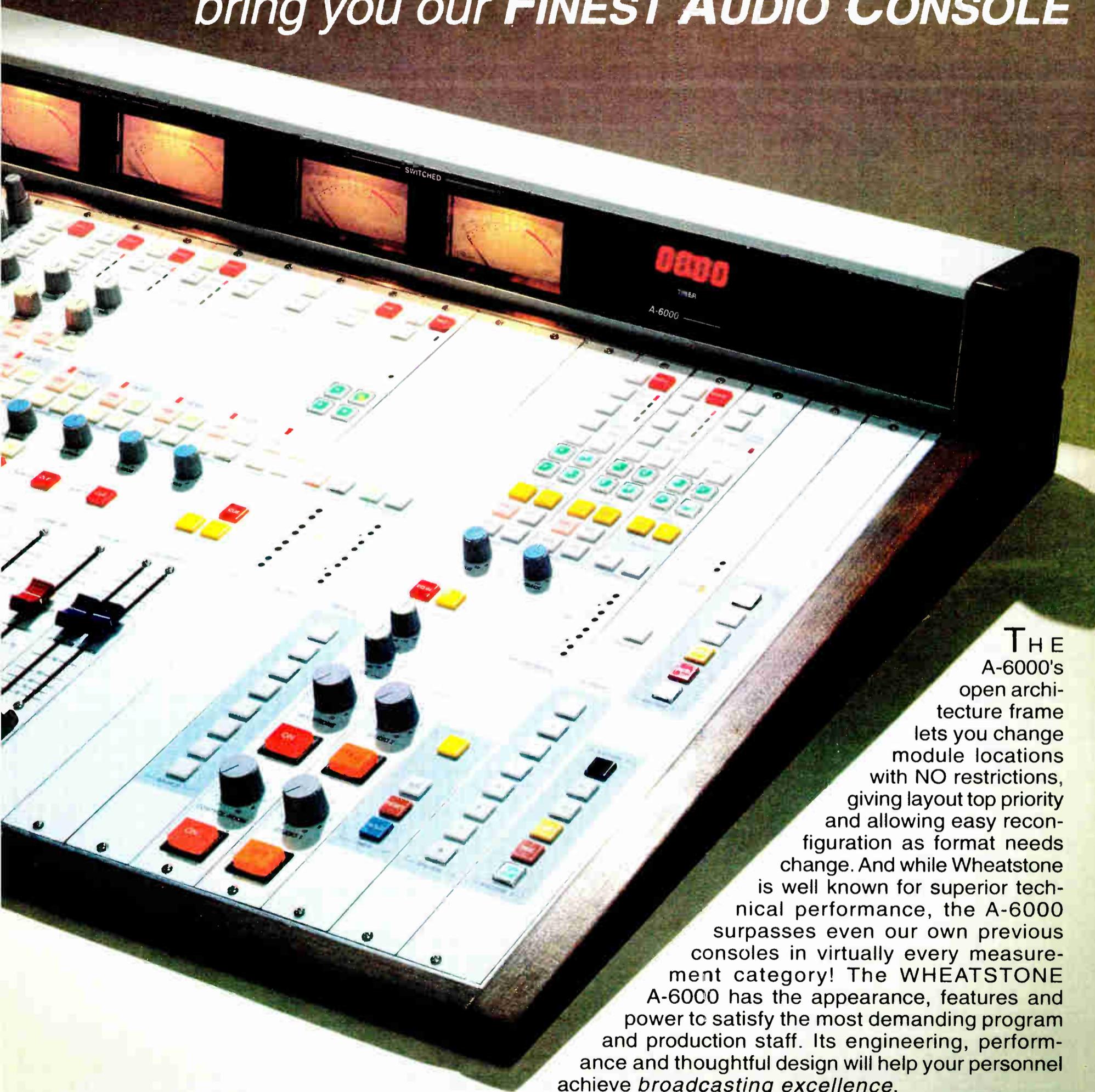
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