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Radio World

An interview
with Larry Cervon,
see p. 11

Vol 17, No 9

Radio's Best Read Newspaper

May 12, 1993

Optimism Abounds At NAB Convention

by Lucia Cobo

LAS VEGAS Judging by the pace of business activity and the volume of traffic on the exhibit floor at the National Association of Broadcasters Spring Convention, optimism about the future of broadcasting is running high.

More than 64,000 people descended on the Las Vegas Convention Center for the week of April 17-22, to attend more than 250 sessions in 12 different conferences, and peruse the offerings of more than 800 exhibitors covering 475,000 square feet of exhibits.

Exhibit floor space dedicated to the radio side of the business extended to 80,000 square feet, and companies took advantage of the separate radio exhibit hall to showcase a wide range of products, including a digital FM exciter from Harris Allied, a new transmitter from Broadcast Electronics and a series of digital machines from Sony, targeted specifically to radio stations.

The buzz at this year's convention, however, was RBDS/RDS products, with new and enhanced offerings from a variety of companies, including CRL and RE America.

Exhibitors were pleased with the traffic on the floor, reporting brisk sales activity and serious browsing from attendees. The first day of the gathering was a newsy one as well with an AM in-band, on-channel, over-the-air digital audio demonstration from USA Digital (see story page 29).

Other early convention news came from the ABC Radio Networks. The company announced that it has just purchased a new generation of SEDAT™ (Spectrum Efficient Digital Audio Technology) digital satellite receivers

enabling ABC to configure up to 102 channels, doubling its satellite distribution capacity.

SEDAT is manufactured by Scientific-Atlanta for ABC. Version I SEDAT worked in the existing hardware (the DAT-32 and DART 384 receivers). SEDAT II has been ported to a new receiver hardware platform. ABC reported that it has invested roughly \$2 million in the SEDAT technology.

ABC will put the SEDAT expansion into immediate use with the conversion of all ABC Satellite Music Networks 24-hour formats to high quality SEDAT digital transmission later this year. To date, the company's programming has been transmitted via two separate satellite vehicles (Satcom C-5 and Spacenet 3). The expansion will consolidate all transmissions to one digital transponder on Satcom C-5.

NAB Radio Board Chairman Wayne Vriesman and NAB President and CEO Eddie Fritts presented 10 radio stations with Crystal Radio Awards for excellence in community service. The winners were chosen from 44 finalists, selected from entries submitted by stations across

continued on page 28 ►



**DAB
at
NAB**

For details
of USA
Digital's
in-band,
AM exhibit,
see p. 29.

Groups Support C-QUAM

by John Gatski

WASHINGTON Looking at Motorola's AM stereo market penetration, supporters of the C-QUAM system told the FCC that it would be ill-advised to reverse the trend by choosing another technology as the national standard.

These and other comments were recently filed on FCC Docket 92-298, the rule-making initiated to implement a U.S. AM stereo standard, which was ordered by Congress in 1992. Approval is expected by the end of 1993.

Support for Motorola as the U.S. AM stereo standard comes from such influential groups and companies as the NAB, the EIA, and Harris Corp.

The FCC's staff report on the rulemaking, which is likely to produce a decision later this year, highlights Motorola's monopoly on U.S. AM stereo with 591 stations broadcasting C-QUAM and 24 million receivers in circulation.

Detractors are quick to point out that the C-QUAM numbers, however, are small compared to the number of AM stations on the air—more than 5,000. However slight that may be in the overall numbers, it is significantly more than the "fewer than 20 stations that now employ the Kahn (ISB) system," C-QUAM's closest competitor, according to the FCC.

In the early 1980s, when the FCC first considered whether to select an AM stereo standard, the Kahn ISB system (named after Leonard Kahn) and several others including Belar, Harris, and Magnavox, were potential rivals for Motorola.

Although Kahn emerged as the closest competitor, there are less than 20 stations and no major receiver manufacturers producing Kahn radios, according to the FCC. Kahn's only hope of beating Motorola may be in the courts, according to industry analysts. Both parties are still involved in a patent infringement dispute.

continued on page 11 ►

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World Radio History

NEWSWATCH

ABC, NABET Reach Four-Year Deal

WASHINGTON The National Association of Broadcast Employees and Technicians (NABET) reached a four-year agreement with Capital Cities/ABC last month.

The contract covers nearly 2,000 engineers, news writers and other staff as well as freelance workers at the ABC radio and TV networks. It includes a 5 percent ratification bonus and annual increases of 3.5 percent, 3 percent and 3.5 percent in the other three years of the contract.

After several months of intense negotiations, both NABET and ABC called the contract "fair."

Fire Destroys Nashville AM, Shortwave Facilities

NASHVILLE, Tenn. A fire destroyed WQM(AM) and WWCR shortwave facilities in early April.

The studios were co-located with their transmitters, but the AM was able to get back on the air with alternative facilities. WWCR officials speculated that it would take a little time to get the shortwave facility back on the air.

Arbitron Sues Station, Alleges Diary Fraud

BAKERSFIELD, Calif. Arbitron has "delisted" KWAC(AM) from the 1993 Winter Bakersfield radio market report and filed a \$50,000 civil suit against the station, claiming it "obtained, falsified and returned two Arbitron Radio diaries" from the survey.

According to Arbitron, KWAC broadcast requests for people who had received cash in the mail to call the station. Although the station's on-air requests did not mention Arbitron surveys specifically, "...the company con-

siders the (on-air) requests to be a direct appeal to Arbitron diary keepers," Arbitron said.

Later, an investigator hired by Arbitron contacted KWAC and advised the station that he had received two Arbitron diaries with cash in them, Arbitron said. "A representative of KWAC obtained the two blank diaries in exchange for a \$25.00 restaurant coupon and offers of other compensation," according to Arbitron. "The two diaries, containing KWAC call letters and listing time entries, were later received through the mail at Arbitron's Maryland production facility."

In 1986, Arbitron filed a civil suit and delisted KELI-AM as a result of a "send in your diaries for cash" campaign.

Solderless XLRs Offered by Clark

NORTHBROOK, Ill. Clark Wire and Cable is now distributing Alcatel Audio Connector's solderless XLR microphone connector.

The patented "jaw" technology is said to reduce assembly time by 100-200 percent using insulation displacement contacts. Volume assembly can be handled using a portable hand tool, the company

continued on page 7 ▶

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Music Distributors Look Beyond Radio

by Frank Beacham

NEW YORK Though commercial radio remains the chief source of consumer music promotion in the United States, record companies are increasingly dissatisfied with today's radio formats and are actively seeking new ways to promote without air play.

This is a key reason music giants Sony and Warner recently invested an estimated \$20 million in Digital Cable Radio (DCR), a premium audio service now delivered to homes via cable television systems.

"DCR will enable us to get past what we see in the radio formatting business of today as an obvious handicap," said

become strong commercial successes despite radio."

Changes in radio

Although the Schulhof said he does not see radio going away completely, he said "the number of formats is becoming broader and yet the audience is in some sense diminishing." Radio is going through a change similar to that of network television, Schulhof said, and is not sure yet where it wants to go. "DCR is certainly another way to divide that channel up and approach niche marketing," he said.

On the broader question of non-broadcast electronic distribution of music, the executives expressed doubts about any

Another music industry trend is direct marketing of recordings, said Eric Kronfeld, president and CEO of Polygram Holding, Inc. He said record companies are now reaching less than half of their potential audience with traditional marketing methods.

Teller reminded the audience that the radio business must never be confused with the music business. "The radio business is the advertising business," the MCA executive said. "Radio stations react to the realities they have to deal with. They couldn't care less what they play. They are not emotionally invested in breaking artists."

What is desirable?

Sony's Schulhof said that technology is here today to deliver digital audio to homes and businesses "in a way that allows a person to make a perfect copy." But he warned, it is not clear electronic delivery of music is what people really want.

"The more fundamental question is the concept of whether a shared common experience—the ability to create a mass market—will be undermined by having easy access of huge libraries of information where there is no focus on individual products," he said. "There is a human behavior question that I don't think any of us fully understand.

"The concept of what makes a book store or a record store or a home video outlet succeed is more than simply the availability of a product," he continued. "Someone who is drawn into a book store by reading what's on the bestseller list looks around and ultimately winds up buying much more than simply the one book that brought him to the store. The same holds true with music. While the customer may be drawn in by radio air play of a particular product, he often winds up buying more music than just that."

In response to the comments from the music executives, radio programming

"Radio stations react to the realities they have to deal with. They couldn't care less what they play. They are not emotionally invested in breaking artists."

— Al Teller, Chairman
MCA Music Entertainment Group

Robert Morgado, Chairman and CEO of Warner Music Group. "Increasingly, we see radio formatting not resembling what we sell."

Morgado joined a group of other top music industry executives during a recent New York conference on the entertainment industry sponsored by Wertheim Schroder & Co., an investment banking firm, and Variety, an entertainment industry newspaper.

"A lot of new alternative music has been promoted without the use of radio," said Michael Schulhof, vice chairman of Sony USA. "Some Seattle bands like Pearl Jam and Alice in Chains have

imminent upheaval in the way music is sold. "I don't believe the ultimate aim in life for a human being is to sit isolated at home in a corner pushing buttons on a black box," said Al Teller, chairman of The MCA Music Entertainment Group. "Shared experience is something ingrained into human behavior."

Teller called for the creation of a network of retail stores connected electronically to huge digital libraries that would allow consumers to purchase any record ever made on demand. Under his proposal, the music would be downloaded and sold to the purchaser on a delivery media custom made in the store.

consultant Ed Shane, who did not participate in the conference, welcomed the music industry's move away from promotional dependence on radio and called it "healthy" for consumers.

"There's no question that radio and records are different media," Shane said. "I think they are right to look at alternative exposure to radio because each industry needs to do what it can to reach its own audience. Part of traditional record promotion is through radio, but I can't imagine that's the only place to do it."

Shane said the music industry has been too dependent on radio in the past. "You can't go to one source any more to find a national audience," he said. "Maybe the record companies have caught up with the fact that this is a niche market. Everybody is in a niche now."



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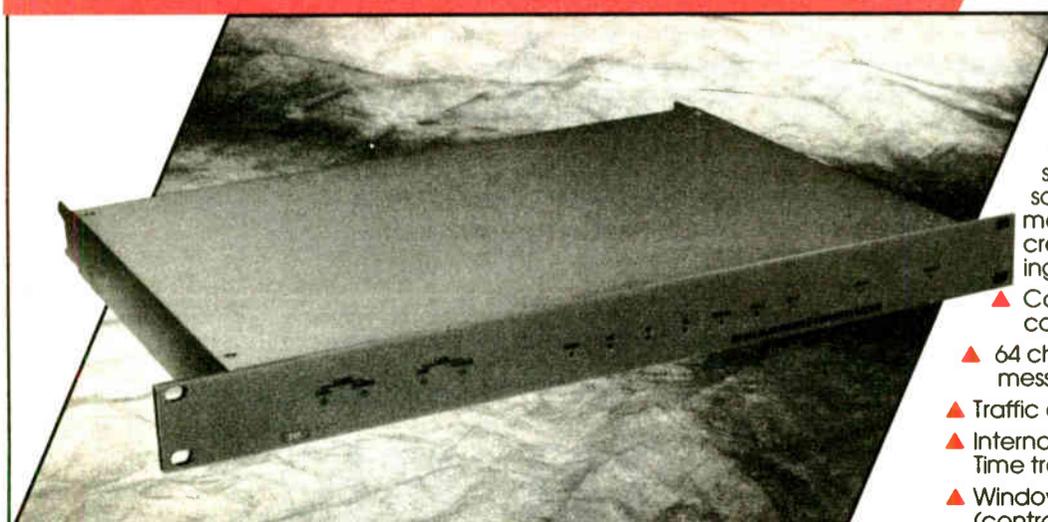
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Stock Up on Ammo for Better Sales

WASHINGTON It is time to say goodbye to 'Vegas and another NAB for now, and as our DC-10 climbs to 37,000 feet through the pitch black sky, I find myself reflecting again on the state of the business.

The media folk must be having a good year to date; attendance at the convention was up by roughly 12,000 over last year's show. And we're not talking browsers. All exhibitors I spoke to reported serious business this spring—one company even sold its floor models.

You'll find the NAB Convention news in this issue, but look for **RW's** complete product wrap-up in the May 26 issue.

There was some news off the exhibit floor. Arbitron made a presentation to the Radio Operators Caucus during its meet-

back. Arbitron hopes to incorporate the feedback into an implementation plan by midsummer, so let your voice be heard.

The most important facet of the proposal for broadcasters (I'll outline the plan below), is that Arbitron has announced it will shoulder the entire cost.

The present form of the proposal was agreed upon in an Arbitron Advisory Council Meeting in Chicago on April 13. The plan calls for:

- Increasing sample targets by 70 percent through reconfiguring the current 12-week survey periods into 18-week rolling average reports and distributing a portion of the ADI and TSA sample to the metro;
- Delivering an 18-week rolling average report every six weeks via electronic download;
- Block coding the diary data base for easier cross-tabulations with other consumer product and lifestyle data bases;
- Allowing for access to each six-week phase of respondent level data through Maximi\$er, Arbitron's previously announced "AID-on-a-desktop" PC application slated for introduction in October 1993.

★ ★ ★

Those of you on the lookout for interesting statistics to use to sell against newspapers might want to know about a recent survey conducted for the Santa Barbara (California) Radio Broadcasters Association. The survey was conducted by the Economic Forecast Project of the University of California, Santa Barbara (UCSB). UCSB has been tracking the Southern California Coastal economy for 12 years, and the results of the survey should be very interesting to radio stations.

The findings, reported in the "1992 South Coast Newspaper Advertising and Consumer Products Survey," are an analysis of newspaper readership of the Los Angeles Times, the Santa Barbara News-Press and the Santa Barbara Independent.

The survey was designed to determine the effectiveness of newspaper advertising and tabulates the degree of recall readers had to advertising featured in the paper. The results are based on 449 adult responses gathered by telephone inter-

views between July 14, 1992, and December 4, 1992.

Radio stations take note: Most respondents could not remember any specific advertisements in the newspapers they had read.

A sample breakdown reveals that 92.4 percent of respondents could not recall any bank advertising during the previous week in the newspapers; 90.4 percent could not recall any clothing advertising; 94.2 percent could not recall any furniture advertising; 92.2 percent could not recall any real estate advertising. 54.3 percent could not recall any department store advertising. 55.9 percent could not recall any drug store advertising and 50.8 percent could not recall any supermarket advertising.

The survey reflects nationwide surveys from the radio industry (call the RAB) which report that a newspaper's circulation is no guarantee of ad readership and recall. For a copy of the survey—there is a nominal fee—contact Ginny Odom at 805-963-1831.

★ ★ ★

Radio megarep, the Katz Radio Group, has released another report as part of its "Focus on Radio" seminar series. For stations thinking about affiliating with a sports team, KRG has some good news. Live baseball broadcasts can boost your nighttime listening by almost 33 percent.

The report, *The Effects of Baseball Broadcasts on Radio Station Audience Levels* tracks the impact of live baseball on flagship stations during the last six years.

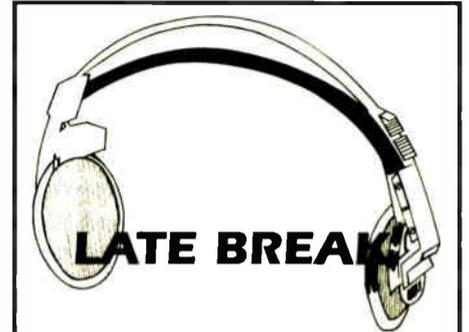
According to Charlie Sisen, VP and director of research and marketing, Eastman Radio, KRG, "The typical radio station realizes a four percent higher total week AQH in spring and summer, as compared to its yearly average. Meanwhile, summer listening M-F, 7 p.m.-midnight, finished 32 percent above the norm."

However, the study does show baseball broadcasts have little, if any, effect on non-baseball time periods. Morning drive estimates remain roughly flat across all seasons, consistent with similarly formatted stations that don't carry baseball.

The above finding negates the notion that

morning drive listening levels on stations that carry live baseball broadcasts drop off once the season is over. KRG data suggests, "because stations that carry Major League Baseball are often the market source for news, morning drive audience levels may actually increase during the off-season when traffic and weather information are key elements in attracting listeners."

The baseball study is available free to KRG clients and agencies.



Philip L. Heltman has been appointed president, Scientific-Atlanta's Signal Processing Systems Division. Heltman assumes the position left vacant by the promotion of Donald V. Upton to president, advanced marketing and sales. Heltman had been VP, acoustic and monitoring systems.

Alan Fuller joined the Unistar Radio Networks as VP/Western Sales. Fuller will oversee the programming company's West Coast sales operations and will be based in Los Angeles. Fuller had previously been with CBS Radio Networks as western regional sales and marketing manager.

Bob Hardy, veteran KMOX(AM) St. Louis broadcaster, died April 18 of a heart attack. Hardy had just celebrated his 33rd year with the CBS station. During his tenure there, Hardy co-anchored the station's morning news program, "Total Information AM," and hosted "Newsblock," a feature with guest experts and questions from listeners. Hardy served as host for "Radio Bridge," a monthly satellite link between Moscow Radio and KMOX.



ing in Las Vegas on April 19. Arbitron outlined the main elements of a proposed redesign of its radio audience measurement service to the 96 continuously measured markets.

Discussions between Arbitron and the Advisory Council on how to improve upon the current service without adding to the cost to subscribers have been underway for two years. The redesign, developed in conjunction with the Council, is in response to industry demand for an increase in "sample size, reliability and utility" of the radio service.

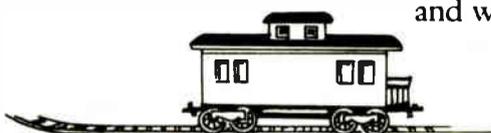
Arbitron will be presenting the council's plan to the NAB Committee on Local Radio Audience Measurement, the Radio Advertising Bureau Board and the American Association of Advertising Agencies. During the course of the next three months, Arbitron account executives for radio stations, advertising agencies and advertisers will be reviewing the proposal with Arbitron clients and requesting feed-



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Know your tower rules

Dear RW,
I would like to respond to an obviously un-researched letter which you recently printed in the March 10 Readers Forum.

In response to the letter on "Questioning Fines" from the gentleman in West Creek, N.J., I would like to ask "Is this your first time in tower lighting and marketing research?"

It is common knowledge that under the Commission's rule 73.1213(a)(b)(c), that every licensee, whether the sole occupant, or the licensee designated as the responsible party, of a given antenna/tower structure, conform to a specific set of guidelines as outlined by the aforementioned ruling and subsequently have on file, a letter of agreement between all co-located licensees.

It is clearly stated under part (c) of this ruling, that in the event that the responsible party shall fail to comply with the requirements as outlined in part 17 of these rulings, that each licensee or permittee shall again be individually responsible for conforming to the requirements of the rules.

We all share a common responsibility to ensure that we are within compliance with these rulings if only to remove the possibility of danger to commercial aircraft and subsequent traffic.

Speaking as the licensee of a 300' guyed tower atop the most predominant ridge in my community of license, I can fully understand the necessity for such a ruling.

I feel that it is important that each licensee or permittee should be ultimately held responsible for the tower painting and lighting requirements. Not to give stations the "out" for not having the work completed, but to ensure that at no time do we present a hazard to commercial and military aircraft (a common site her). It is additionally important to understand that there are many other instances under which each licensee is held responsible for their

actions independent of other broadcasters. This should be no different.

We are all familiar with the Commission's push to ensure present and future compliance, and it simply will make things easier for all of us when we take the time to ensure that every one is responsive to this need.

Take a little time and review your information. There is enough "bad scoop" going around without some poorly researched information throwing a wrench into the works.

Aaron Wasilweski, SBE, Chief Engineer
Northwest Broadcasting Company
Yakima, Washington

Do we need AM RBDS?

Dear RW,
I am surprised and alarmed that you've chosen a look-on-the-bright-side approach in reporting early problems discovered with an AM version of the Radio Broadcast Data System (March 10 RW).

To encourage listeners to use narrow-bandwidth reception for the sake of minimizing interference noted with RBDS is questionable at best and possibly destructive for what little market AM is hanging on to.

Bell Labs many years ago discovered that clarity of speech reception relies heavily on the ability to pick up the sibilant sound such as "s" and "ch." Those are the first sounds to go when bandwidth is restricted.

News/Talk stations on AM convey speech as their main programming. Let's keep the priorities straight and spurn any systems or standards that compromise fidelity for what may provide to be only a marginal information service with RBDS.

Paul S. Courson, Anchor/Reporter
AP Network News
Washington, DC

More on SCA suit

Dear RW,
Your recent article concerning the FM broadcast subcarrier litigation won by our client, Korean-American Broadcasting Co. ("SCA Battle Results in Suit; KBC Wins in Civil Division," RW March 24, 1993) was very informative in highlighting the perils of distributing tunable FM subcarrier receivers in violation of Section 605 of the Communications Act. Congratulations to Dee McVicker for publicizing the U.S. District Court decision against the defendant, a competition Korean subcarrier broadcaster.

However, I would like to make a few observations and corrections. The article quotes defendant Chu as saying that the tunable radios were distributed only prior to KBC's commencement of broadcasts on the 92 kHz subcarrier which was receivable on the radios. In fact, Chu admitted, and the federal court's decision states, that he continued to distribute the tunable radios until the suit was filed. Thus, he dis-

AM's Fighting Chance

For a number of years now, a U.S. broadcast system with no AM band has been thinkable in many minds. Intolerable interference, often unimaginative programming and consumer receivers sounding something like string connecting two soup cans all undeniably did their part to devastate the once dominant broadcast medium.

A survey of the AM landscape in May 1993, however, presents a surprising amount of good news.

FCC approval of several measures to clean up interference on the band have had their incremental effect. The migration of some of the most seriously interfering stations to the expanded band will improve the situation even more in many markets.

An AM stereo standard will soon be a reality. Congressional mandate for a decision ends all delay due to FCC fear of litigation.

Improved, high-fidelity AM receivers could be an even more effective tonic. Such radios are still rare, but FCC interference reduction measures, a stereo standard and the development of ICs to make quality AM receiver manufacturing cost-effective should suggest to some companies that there is a business there.

New FCC duopoly rules and the rise in local marketing agreements have made it possible to keep some AMs operating when it might have made business sense to let them go dark before.

Those who were unlucky enough to go into the AM business in the late 1970s to mid-1980s are still not likely to recoup all of their investments. But that could be said of a lot of investments in that era.

What is possible is an era of stability. AM may not produce any Murdochs, Tishcs or Malones, but it can provide a living for many entrepreneurs while providing the local service all towns need.

Perhaps the most encouraging development—the kind that could insure AM stability—will be AM in-band, on-channel digital audio broadcasting.

Picture the morning commuter in 2010 listening to digital music and local news just where it has always been—on AM—as if there was never a chance it could be taken away. That vision is within reach.

—RW

tributed the tunable radio's after KBC came on the air and after he knew the radios could intercept KBC's broadcasts.

Second, the suit was brought solely by KBC against Chu and was not a "class action" suit as stated in the article.

Third, Chu's ranting about a KBC affiliate in Baltimore violating the Act is a red herring. There was no evidence whatsoever to this effect in the case. What's more, even if it were true, it would be beside the point. It is no excuse for Chu's violation of the law to say that some other person may have committed a similar wrong.

Finally, the evidence and arguments assembled against Mr. Chu and his company in this case were so overwhelming that U.S. District Court Judge Lamberth issued both an injunction at the beginning of the action and later a summary judgment against the defendants. Thus, no trial was needed to decide Chu's guilt. A trial will be held later only to assess the amount of damages he and his company will be ordered to pay.

James M. Weitzman
Kaye, Scholer, Fierman, Hays & Handler
Washington, DC

Early history of FM

Dear RW,
With reference to the Reader's Forum section in the March 24 RW where a controversy has arisen regarding the early days of FM broadcasting, I submit the following evidence.

WMBI has been broadcasting since 1926 for the Moody Bible Institute. When FM broadcast technology offered its potential in the early 1940's, Moody applied for and received authorization to operate an experimental FM station on October 11, 1941. The call letters were W75C and the frequency was 47.5

MHz. (megacycles in those days)
In November 1943, the call letters of W75C were changed to WDLM which coincidentally, are the initial of Moody's founder.

In 1946, The Commission began requesting the aforementioned relocation of the FM broadcast spectrum from the low to high band. As can be seen from the related file number B4-RH-36, WDLM was authorized dual frequency operation of 47.5 MHz and 99.7 MHz until everyone was in compliance.

This early activity makes Moody one of the pioneers in FM broadcasting and one of the earliest FM station owners.

Bob Caithamer
Director of Engineering
Moody Broadcasting
Chicago, Illinois

Looking for photos

Dear RW,
The Minnesota Broadcasters Association was founded in 1949, the second person to serve as MBA President was Melvin Drake.

In 1949 and 1950 Melvin Drake was General Manager of the original WGGY in Minneapolis. Anyone knowing the whereabouts of Melvin Drake or any of his kin who may be able to supply us with a photograph is asked to call or write the Minnesota Broadcasters Association.

In the 44 year history of the MBA we have had 24 Presidents. In trying to build a photo gallery of them, we are missing only a photo of Melvin Drake. We know someone who reads RW will remember and help us locate a photo of Melvin Drake.

Jim Wychor, Executive Director
Minnesota Broadcasters Association
St. Louis Park, Minnesota



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Bruce Ingram, Pamela Watkins, Nancy Reist
Technical Editor John Bisset
Technical Advisor Tom McGinley
Editor (International) Alan Carter
Managing Editor (International) Charles Taylor

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May 26, 1993



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U.K. Interest in AM Stereo Wanes

by Tim Frost

LONDON Delays in government studies of AM stereo, along with the promise of Digital Audio Broadcasting (DAB), have most industry analysts in the United Kingdom convinced that the technology has missed its chance.

With the recent mono launch of the U.K.'s first national commercial AM service, Virgin AM, discussion on the future of AM stereo in the U.K. has reawakened somewhat. But initial interest in stereo AM seemed to have peaked in the commercial radio sector a couple of years ago, when the C-QUAM AM stereo system was established as a viable transmission system in the U.S. and Japanese broadcasters investigated it for their national transmission format.

Adoption of a stereo AM standard depended on two key factors. First, the

interest from radio stations themselves was moderately strong, but conditional on the availability of stereo AM receivers. Then there had to be testing and approval of the format by the government agency controlling the allocation of radio spectrum (the Radio Communications Authority) and the Radio Authority, which licenses and controls all commercial radio stations in the country.

Implications of C-QUAM

The RCA established a committee to investigate the implications of C-QUAM transmissions and the possibility of increased interference between stations close to each other in frequency. Some tests were carried out by transmitter manufacturer HCD using Delta Electronics equipment. These tests primarily aimed at checking the suitability of HCD transmitters for stereo work.

"We were asked by several stations how our transmitters would function in stereo," HCD's MD John Heaviside said. "We ran transmitter tests which showed that the system would work, although we think that some stations might have problems with their existing high-Q aerial installations."

The RCA's primary interest in the tests was the protection ratio on adjacent channels to avoid interference, Heaviside added.

A true picture of how AM stereo would function in the U.K. would have required extensive tests financed by the radio industry itself. Since the Japanese were adopting C-QUAM and doing identical research work, RCA concluded it could use the research carried out in Tokyo to check the system's applicability to the U.K., thus short circuiting the need for long and expensive tests in the U.K.

According to Martin James of the Radio Authority, this simple solution introduced further delays and has yet to lead to a decision by the Radio Communications Agency.

"The RCA had to wait some time for a translation of the Japanese research work. When they got it they found that it didn't answer all the questions," James said. "Now things are quiet on stereo AM because people are looking at DAB instead."

"If broadcasters such as the BBC or Virgin Radio wanted to take up stereo AM, then we would continue to actively

push for it, but at the moment, the main interest is in digital so that is where we are putting our resources," he said.

Fairly quiet

This conviction is confirmed by U.K. Delta Electronics representative John Gurr: "It has gone fairly quiet in the U.K." The market has banked on the Japanese to make stereo AM radios widely available for car and home use, he said, "but there has been little evidence of any of this coming over to the U.K. We've been waiting for some sort of decision for a long time. We are still waiting."

Clearly, after two year's delay, interest in the idea has diminished and smaller stations want to see stereo AM radios in the shops, stimulating consumer interest, before they reconsider investing in stereo.

Consumer electronics manufacturers, meanwhile, view the situation from the distinct opposite perspective: they want to see a stereo service in place before committing to manufacturing receivers for the U.K. market.

It would now take a national broadcaster to lead the move into stereo AM. The BBC is known to be very cool on the subject, leaving only the new Virgin AM as a possible catalyst. Virgin, which started its service at the end of April, was interested in stereo, but with no interest from the public in general, no receivers available nor a decision from the RCA, the station took the idea no further.

Stereo, however, is still a possibility for Virgin. Engineering staff said that no final decision has been made and that stereo has not been ruled out.

NEWSWATCH

► continued from page 2

said. For more information, call 1-800-222-5348.

Digital Seminar Set For June 17-19 at WDET

DETROIT NPR station WDET-FM will hold a three-day digital conference June 17-19.

According to Production Manager John Patouhas, the session will focus on digital basics, workstations, audio mixing, data compression and digital broadcasting's future.

BBC engineer Mark Decker, who helped develop Ambisonics Surround-sound, will be one of the conference leaders.

The registration fee is \$150 before May 31. Attendance is said to be limited to 35. For more information, call 313-577-4146.

Claudy Named NAB VP of Technology

WASHINGTON Lynn Claudy has been named vice president of the NAB's Science and Technology department.

Claudy joined the NAB as a staff engineer in 1988 and later served as director of advanced engineering and technology, which involved advanced television technologies.

Claudy has worked in a variety of technical positions for companies involved in broadcast products including Shure Brothers and has lectured in audio-related topics at American University.

NAB How-To Brochure For Buying Stations

WASHINGTON The NAB has published a brochure on how to buy a radio station.

The publication, "Radio Station Ownership: 4 Steps To Making a Station Yours!" details the legal and technical requirements for radio station acquisition. It includes a brief explanation of radio ownership rules, the pre-buy evaluation process and station inspections procedures, and outlines the forms and contracts needed to complete the transaction.

For more information, call the NAB Radio Department at 202-429-5420.

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An Interim Chairman With a Radio Agenda

by Randy Sukow

LAS VEGAS Interim FCC Chairman James Quello has little time to lead the commission on which he has served for nearly two decades. But in a few months, Quello has compiled an impressive list of actions two- or four-year chairmen could not boast.

In his few months at the head of the truncated, three-man FCC, he has already ushered in a new era in television with landmark commission rulings on cable television rate regulation, rules requiring access

to cable programming for alternative video media, such as direct broadcast satellite and wireless cable and rules requiring cable systems to carry all local broadcast TV signals and in some cases pay local broadcasters retransmission consent.

The Quello FCC has aided the TV networks with new financial interest and syndication rules developed after years of fighting at the FCC and in the courts.

With the time he has left—weeks or months as chairman and three more years as a commissioner—he appears to be ready to be ready to put the Quello

mark on radio as well.

"(Radio) was my first love...I was active in radio in the real golden era—before TV," the interim chairman said at a luncheon sponsored by the National Association of Broadcasters and Radio Advertising Bureau during the NAB's Las Vegas convention. During the speech, he pushed all popular buttons for a partisan radio crowd by taking a number of positions:

- High priority on development of in-band, on-channel, terrestrial digital audio broadcasting.
- Rejection of satellite-delivered DAB.
- Support for the NAB-proposed freeze on new FM station assignments.
- Support for the manufacturing and marketing of high-fidelity consumer AM receivers.

"I'm really not too happy with radio's plight today. I never thought I'd live to see the day when 62 percent of the radio stations are actually losing money...We just have to do something about it," Quello said.

The commission over the past several years has had a mixed record when it came to sound radio policy, Quello said. Last year's change in the total national radio ownership levels and allowing limited duopolies was an example of good policy.

"On the other hand, not all of our regulatory choices have been helpful. A case in point is Docket 80-90. I have to say I was critical of this early," he said. Quello seconded the NAB position that the new 80-90 FM's diluted the available advertising revenue in several radio markets and forced a number of stations to go black or cut down on their amounts of public-service programming.

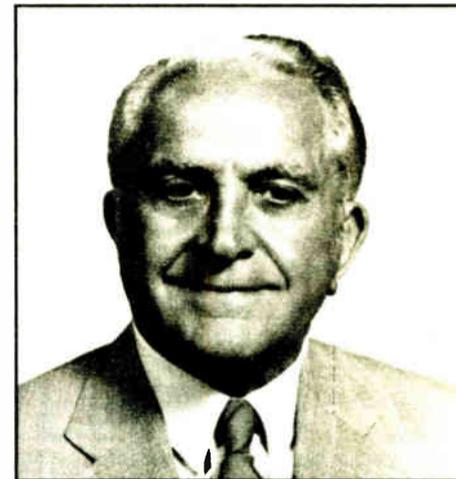
"Government has to join in (the initiative to help radio). First we should consider proposals to limit the allocation of more licenses. We should thoroughly explore all possibilities of the NAB request for an FM freeze, especially at a time when efforts are being made to develop FM DAB," Quello said.

The freeze idea, a major NAB lobbying initiative in early 1992, has been a dormant issue after the Alfred Sikes FCC rejected the idea and as more weighty issues, such as the new radio ownership rules, fin-syn and cable reregulation, began to dominate FCC attention in the second half of last year. Quello's remarks appear to rejuvenate the issue.

Another step the FCC could take to protect local radio's advertiser and listenership bases would be to reject satellite digital audio broadcasting. "What would be the effect on local radio service if we had 30 to 50 new radio voices from a satellite in every community. It seems we've already

flooded the market in the name of competition and diversity."

He was as complimentary to terrestrial DAB—especially in-band, on-channel DAB—as he was disparaging to the satellite version. "For radio to remain viable, government and the terrestrial audio broadcasting industry must engage in some interdependent strategic planing to effect in-



James Quello

band digital audio broadcasting for both FM and AM," Quello said.

Ironically, Quello's views on satellite DAB appear to be in conflict with those of his greatest Capitol Hill supporter, House Energy and Commerce Committee John Dingell (D-Mich.). (Dingell was instrumental in fellow Michigan native Quello's appointment to the FCC in the early 1970s and was a strong supporter of Quello's appointment as interim chairman earlier this year.)

DAB is not yet a Congressional issue, but the key committees are watching the commission's DAB actions, said Dingell aide David Leach during an NAB Congressional staff panel session. There is a general sensitivity to radio's economic woes in Congress, Leach said, but "I'm not sure you'll be persuasive in telling the government to say to the entrepreneur 'You have to wait until your competitors are geared up and ready to enter the market.'"

Quello aide Robert Corn-Revere later clarified the chairman's position. The main point is that in-band DAB must be developed quickly so that terrestrial broadcasters are not left behind. "I think realistically there is no stopping the emergence of (satellite) digital audio radio and frankly there is no policy justification to support trying to delay the technology," Corn-Revere said.

A review of fine schedules was another Quello pronouncement that was happily received by broadcasters.

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Warnings Make Heavy Reading

WASHINGTON The Thurmond-Simon bill (S. 674) would require radio stations airing beer or wine commercials to read a warning "as part of the advertisement in an audible and deliberate manner and in a length of time that allows for a clear understanding of the health message by the intended audience." One of seven messages would be read in alternating procedure to be developed by the Department of Health and Human Services following enactment.

1. "SURGEON GENERAL'S WARNING: If you are pregnant, don't drink alcohol. Alcohol may cause mental retardation and other birth defects."
2. "SURGEON GENERAL'S WARNING: If you are under the age of 21, it's illegal to buy alcoholic beverages."
3. "SURGEON GENERAL'S WARNING: Alcohol is a drug and may be addictive."
4. "SURGEON GENERAL'S WARNING: Drive sober. If you don't, you could lose your driver's license."
5. "SURGEON GENERAL'S WARNING: Don't mix alcohol with over-the-counter, prescription or illicit drugs."
6. "SURGEON GENERAL'S WARNING: If you drink too much alcohol too fast, you can die of alcohol poisoning."
7. "SURGEON GENERAL'S WARNING: Drinking increases your risk of high blood pressure, liver disease and cancer."

See related story on page 29.

FCC Ready For Expanded Band

by Randy Sukow

WASHINGTON It took a while—longer than some AM broadcasters wanted to wait—but the FCC has finally opened a filing window for those stations willing to migrate into the expanded AM band.

The commission began accepting applications for stations willing to migrate to the 1605 kHz-1705 kHz band as of May 3 and will continue to receive them until June 30.

First-step filing procedures require only three simple items: an opening letter requesting migration; a short description of the licensee's current operation (including calls, frequency and community of license), and statement of whether the licensee plans to broadcast stereo in the expanded band.

The FCC's expanded-band proceeding had been delayed by several developments, including consideration of competing implementation arguments.

Those stations eventually granted expanded-band licenses will be allowed to operate on both their new and current frequencies for five years, after which they will be required to turn in their original licenses. Those original assignments will not be reassigned.

By international agreement, Western-Hemisphere governments have been free to authorize AM broadcasting out to 1705 kHz since July 1, 1990. But the FCC's expanded-band proceeding was delayed by several developments, including consideration of competing implementation arguments.

Commercial AM broadcasters, led by NAB, argued that the expanded band should be populated through a migration

of current licensees in an attempt to reduce AM interference created by overcrowding of the current band. Minority-owned and public broadcasters called for assignment preference to broadcast new, more diverse services.

"I think there is frustration (among AM broadcasters) that it has taken this long," said Barry Umansky, deputy general counsel, National Association of Broadcasters.

But NAB is satisfied with the policy the Commission has finally chosen, Umansky said. "Here it was clear the FCC's paramount concern was interference reduction, and they seem to have stuck to their guns on that one (in the filing announcement)."

After the June 30 application deadline, the FCC will use a computer program to create a priority list with preference to

the (National Radio Systems Committee) standards, are going to incrementally result in the AM band sounding a lot better," especially as higher fidelity AM receivers reach store shelves, Umansky said.

One remaining issue is the fate of the Travelers' Information Service (TIS), currently operated by federal agencies at 1610 kHz, and displaced by the expanded band migration. The FCC said it will later initiate a proceeding to explore moving the primary TIS allocation to 1710 kHz. TIS stations will remain on 1610 kHz on a co-primary basis in the meantime.

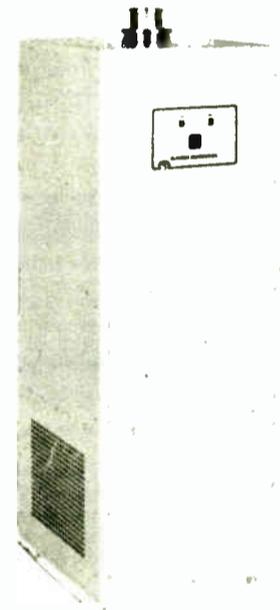
stations that will relieve interference the most by changing frequency.

(By Congressional mandate, daytime-only stations located in communities of 100,000 or more and in the primary service area of a Class I station, will have first preference for migration to the expanded band if they declare the intention to become full-time stations. This preference outweighs interference-reduction criteria, but will only apply to a handful of stations.)

The expanded band is one in a series of recent FCC and industry actions aimed at improving the technical quality of AM. "Over time the expanded band, taken together with tighter interference-protection standards among stations and

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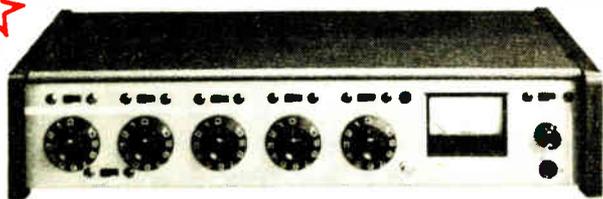
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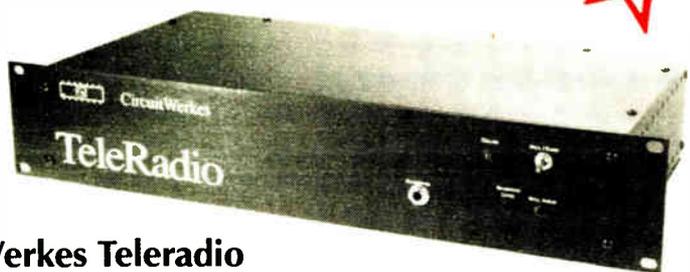
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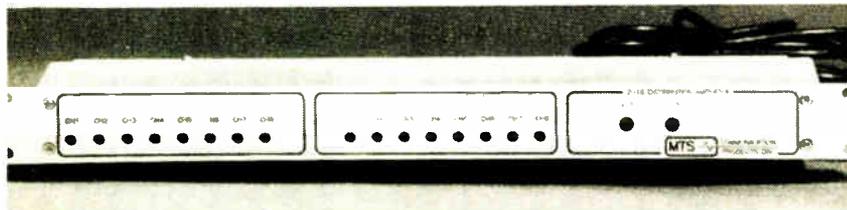
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Opposition Resurrects Criticism of the 1980s

by John Gatski

WASHINGTON As in previous debates over AM stereo systems, the 10-year old Motorola C-QUAM system has taken shots from its detractors in comments on the FCC's rulemaking to mandate the technology for all AM stereo broadcasters.

A number of engineering comments recently filed on FCC Docket 92-298 reveal persistent opposition to selecting C-QUAM as a national standard.

The FCC initiated the rulemaking in late 1992, based on legislation passed by the Congress, which believed that AM needed a technical boost to win back listeners who have abandoned the band as station crowding forced narrowed receiver bandwidths, which reduced receiver fidelity to telephone-like quality.

C-QUAM has become the focal point for FCC action because it is considered the de facto standard in the marketplace over the handful of others that competed against it in the 1980s. At that time, the FCC considered, then decided against approving an AM stereo standard. With the clout of Congress behind standardization in 1992, however, the C-QUAM standard is expected to be approved by the end of the year.

Opposition to C-QUAM continues to be based on its technical qualities, according to the comments.

Compared to what

The Hazeltine Co., co-developer of the ISB System with Leonard Kahn, said that 24 million receivers and 12 percent AM broadcaster use of C-QUAM is not strong evidence that C-QUAM is strongly supported in the U.S.

The company called on the FCC to "promptly undertake an expedited technical evaluation of the C-QUAM and Kahn/Hazeltine systems and base its selection...solely on the results."

(Leonard Kahn, who is in litigation with Motorola over patent infringement, did not file public comments by the April 5 due date, although he did request a time extension, which was denied. Kahn did make another request and submitted a letter to the FCC; they were not subject to public inspection).

Lee S. Parr, a retired broadcast engineer who praised the Kahn system, said AM broadcasters have not overwhelmingly accepted C-QUAM because of its technical limitations. "Is C-QUAM's strong penetration in the market a result of technical superiority and consumer and broadcaster acceptance?" Parr asks, "or is it the result of strong marketing pressures that have left the consumer and broadcasters with no viable choices?"

Others echoed that sentiment. David L. Hershberger of Nevada City, California, said: "It is difficult to argue with the dismal performance of the Motorola

System...AM broadcasters need technically superior AM stereo systems to compete with FMs, CDs, cassette tape and digital audio broadcasting."

Engineers' choice?

Hershberger said the Harris and Kahn systems are "the broadcasters' favorites" and combination of the two's advantages could create a quality AM stereo system. Since the FCC rulemaking requests input on whether the few Harris systems still being used should be allowed to operate once the C-QUAM is standardized, Hershberger said it would be in the "public interest" to do so.

Questioning of the FCC's intent to standardize C-QUAM is not limited to individual "pro-Kahn" engineers. Capital Cities/ABC said "there are serious unanswered questions concerning the quality and superiority of the Motorola system. Blanket endorsement of the Motorola system and the requirement that all other systems be abandoned may be ill advised

C-QUAM is considered the de facto standard in the marketplace.

where the Motorola non-linear modulation creates more high-order distortion products than linear modulations such as Harris...."

ABC suggested that a standard be adopted without naming a particular system "to

allow for the play of competitive forces to foster quality improvements."

ABC Engineering Chief Ken Brown said that neither the Kahn nor the Motorola systems may be the best system when it comes to allowing "AM radio to continue to develop for the future...."

In its comments, Communications Technologies Inc. said that not only should further testing be done with both Kahn and Motorola systems, but the NAB/EIA AMAX receiver standard needs to be implemented along with an AM stereo standard. Currently, the AMAX receiver standard, which includes increased bandwidth, adjustable bandwidth, noise blanking and external antenna connections for improved reception capability is voluntary.

Broadcast Engineer James Torrence said it would be premature to select any AM stereo standard until other considerations are addressed including AM signal transmission, receiver standards, spectrum adjustment to protect the sideband, and channel spacing.

Engineer Christopher Hays said none of the proposed analog AM stereo technologies may be right for AM broadcasting in the future. "Indeed, you can reverse some or all of the damage done in the last three decades (to AM) by approving an advanced digital technology that can carry AM radio into the next century," he said.

In addressing the criticism of C-QUAM, Motorola's Frank Hilbert said, "If there was anything to this C-QUAM wouldn't have gone anywhere."

C-QUAM Gets Support

► continued from page 1

Motorola also has global momentum going for it. FCC research shows that six countries: Canada, Mexico, Australia, Brazil, Japan and South Africa have implemented C-QUAM as their AM stereo standard.

"We believe," the FCC engineering staff report said, "that the selection of an alternative (in the U.S.) to the Motorola system would set back the clock on the implementation of AM stereo service."

The FCC speculated that stations already burdened by declining revenues would suffer more by having to buy new stereo equipment.

The NAB called the AM stereo rule-making "rational and warranted." "Indeed, NAB considers the instant FCC proceeding as part of a more comprehensive program of maximizing the technical and service potential of AM radio," the comments stated.

The Harris Corp., which at one time had a promising AM stereo system, still considered technically inviting, also favors the C-QUAM system. "Several years ago, Harris dropped its proposed stereo system and, being a proponent for AM stereo service, has supported...the

Motorola C-QUAM system," the company said.

Harris added that it has encouraged the stations that use its AM stereo technology to convert to C-QUAM, noting that some compatibility already exists.

Broadcast Electronics and Delta Electronics, both producers of C-QUAM transmitting equipment, also support the FCC rulemaking, according to their filings.

John Tibilietti of Paloma Blanca Radio (KTXN-FM Victoria, Texas) said his company favors C-QUAM because of "uniformity in the industry." He also asked for clarification about the effect of

stereo on nighttime limits; and called for more research on the compatibility of subcarriers and AM stereo.

The Washington, D.C.-based firm Cohen, Dippell and Everist congratulated the FCC on its AM stereo efforts, but said it has conducted tests that show that the Class B stations need a higher daytime service contour to maximize the stereo signal.

From its tests, the firm concluded that "the AM stereo signal is significantly improved when the field strength is in excess of 1mV/M."

FCC research shows six countries ...have implemented C-QUAM as their AM stereo standard.

Cervon: Equipment Niches Now the Rage

Editor's Note: Larry Cervon started his career in broadcasting in 1945, when he left the service and joined RCA International. In the ensuing years, he witnessed the explosion of radio from 900 to well over 10,000 stations nationwide. He worked for and later succeeded legendary Parker S. Gates at Gates Radio, which would later become Harris.

In 1976, after a brief stint in a related field, Larry returned to the radio industry as president of Broadcast Electronics and moved the company to Quincy, Illinois. A few years later, he was involved in the purchase of Broadcast Electronics from Filmways Inc. (now Orion Pictures).

Larry retired in March of 1991, after 47 years in the industry.

Recently, RW contributor Dee McVicker talked to Cervon at his winter home in Florida.

RW: Give me an idea of the twists and turns radio has taken.

Cervon: It was an industry that was always full of ups and downs because of the FCC. As an example, during the Korean war the FCC put a stop on all construction of radio stations because

we needed the copper and different materials for the war. This was in 1951, and they put the freeze on so we couldn't even sell equipment.

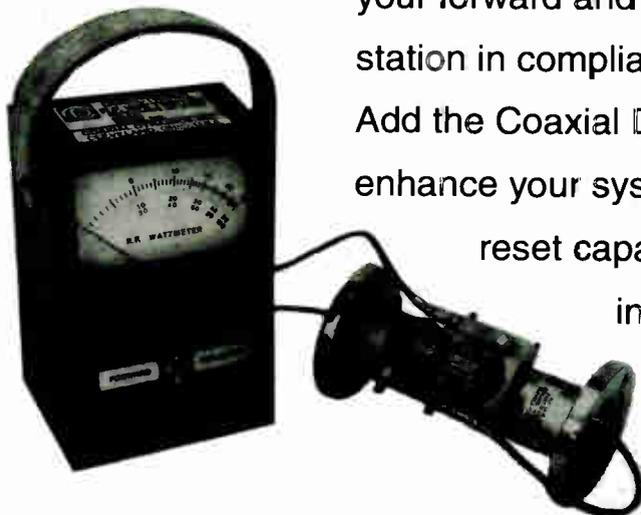
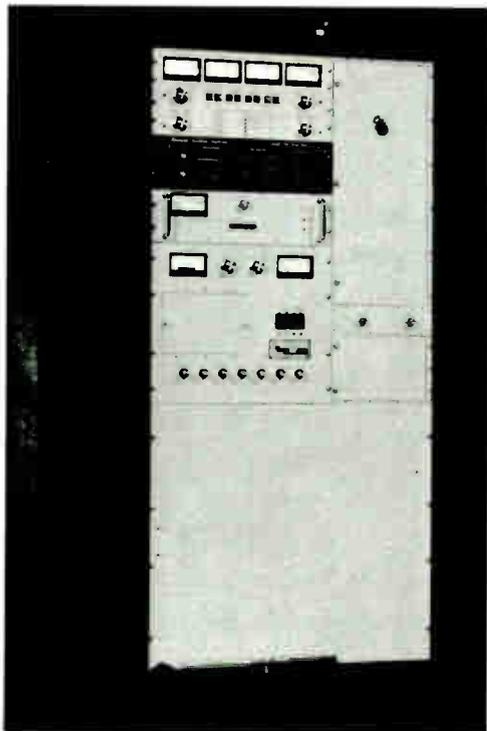
RW: What about the trends in radio engineering?

Cervon: For the first 10 years or more of my career selling broadcast equipment, if you can visualize this, every single station in the United States had a man at the transmitter building every minute the station was on the air. He was an engineer in charge of that transmitter. The largest station had two or three people on duty. So the first major thing that happened was the commission of remote control of transmitters. Then the next thing that happened was program automation. And that evolved slowly and the idea there was to try to provide more accuracy in the programming by pre-recording certain parts of it so you'd have better control.

RW: Did you feel FM would take off to the extent it did?

Cervon: Yes I did. FM immediately brought stereo, it brought something the listener didn't have. It was an

continued on page 28 ►



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Satellite Networks:
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page 20.

MARKETING & MANAGEMENT

Targeting Through Segmentation

by John Cummuta

ALGONQUIN, III. This time out I want to discuss customer segmentation. Customer segmentation means dividing your customer database (list) into subsets, according to specific characteristics each group of customers has in common. You do this in order to sell the products or services to each segment that their common characteristics indicate they would want.

The lines have vanished that once allowed marketers to determine, with relative assurance, that certain products and services were of interest to easily-identifiable, broad demographic groupings such as a gender or an age group.

Three decades ago, 70 percent of all households were made up of a father who worked outside the home, a mother whose full-time occupation was "homemaker," and two or more school-aged children. Today only 14 percent of American households fit that description.

There was a time when "over age 65" meant "gone fishing." Today, our senior citizens are not only active, but many have started their own businesses to pick up where their jobs left off. They are dynamic contributors to today's economy, not passengers. And they have the bulk of the spendable money in today's consumer marketplace.

All these variations of consumers in your marketplace demand unique marketing approaches. You cannot effectively

send the same message to each different kind of prospect and expect them to all respond favorably, or even similarly.

Collecting information can help you target a product, for example, that research has shown sells best to caucasian women, ages 18 to 30, in upper middle class neighborhoods, who purchase using a credit card.

If you have collected all these pieces of information about every one of your customers, you can now select out (segment) only the young women who fit the above criteria. That way you will be able to send your advertising message *only* to your optimal prospects for this product, and not waste marketing dollars or energy on your other customers who do not fit the profile.

"But," you might say, "if you're right about needing to tailor my marketing approach to each type of consumer within my overall customer base, what a task it would be to capture all that information, then sort them all out, and then approach each group with their own specific message."

My answer would be that such pessimism would have been justified a few years ago, but today's technology has made it possible to not only identify the variations in your consumer public, but to respond to their various needs individually. And, after the initial setup period, all this activity could actually take less time and effort than you probably put into it

now. I have consulted businesses that, once the system was operating, got more accomplished with two-thirds less people working on sales and marketing projects.

Where you keep your computer is your data processing room, and in terms of Customer-Focused Direct Marketing, it is the most important room in your business.

I'm not talking about large, complicated computer systems here. Everything I am dealing with in these articles can be done on a Personal Computer (preferably 386 or higher). I'll more specifically examine software in a future article (see also the Nov. 4, 1992 issue of RW).

While you could use a manual system to track all this customer information, the efficiency losses compared to a computer would probably negate any marketing

gains. The fact is that the database segmentation process is so perfectly aligned with a computer's strengths that there is simply no rational approach to database marketing without using the PC.

As I said above, the goal in direct marketing is to offer your various products and services *only to customers and prospects most likely to respond*. That's the advantage and power of database marketing.

But, to do that effectively, you must know a lot about your customers, as individuals.

Next month I will list the minimum individual customer characteristics you should capture on each customer.

□ □ □

John Cummuta is an independent Marketing and Management consultant, and the author of the Sales Machine database marketing course and Sales Machine PC database marketing software. He can be reached at (708) 658-9107.

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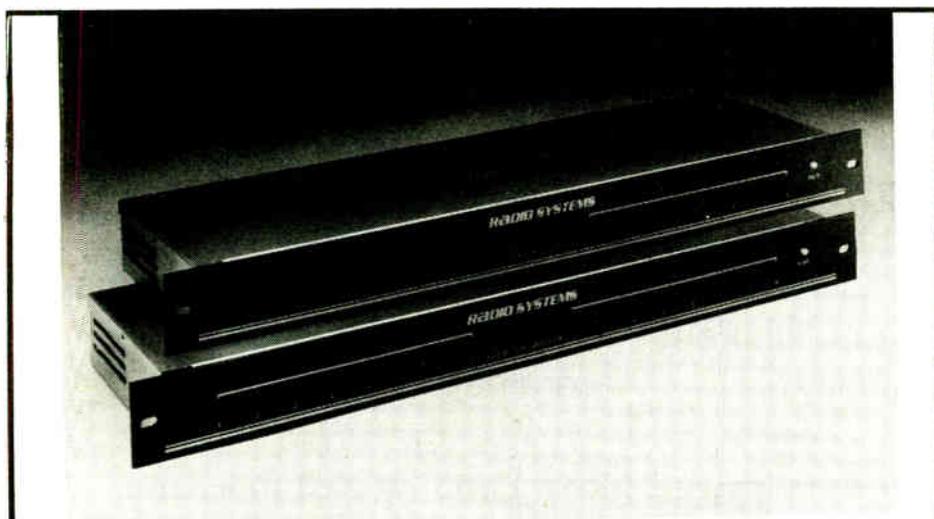
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Today's Milestones Etch Radio's Future

by Charles Taylor

FALLS CHURCH, Va. At year-end, I ventured to say that 1992 was a year in transition, a time when the industry was still defining its destiny for the decade.

Enough, already.

As we end the second quarter of 1993, it is time to take stock in the realization that where we are now stands a pretty good chance of influencing where we are going—for better or worse. Trends in music, technology and other facets of the radio industry will be definitive in shaping the remainder of the decade, into the next century.

Here's a checklist of major milestones throughout the industry—elements that will either help propel us into the future or shame us years from now.

- The battle between the Sony MiniDisc and the Philips Digital Compact Cassette disregards the notion that just maybe, consumers have barely gotten used to discarding their vinyl for compact discs before they are being bombarded with two more music carriers.

These technological "advances" could end up backfiring, convincing consumers that investing in new technology is futile if manufacturers threaten to replace it every five years.

Yes, there is value in the DCC as a parallel digital technology for the cassette, since it is compatible with the present format. But MD? Like DAT, I'm not convinced.

- Much of the world is poised to enjoy the benefits of Digital Audio Broadcasting, thanks to quick action regarding spectrum, system proponents and regulatory wrangling.

Unfortunately, it's just not that simple in the U.S., where the most appealing spectrum already is being used by a very protective military and proponents are as plentiful and as varied as formats on the

FM dial. Lawmakers and decision makers are not helping either: the Federal Communications Commission, National Association of Broadcasters and hardware manufacturers are divided on key decisions not only between themselves, but within themselves.

My guess is that by the time all minds are made up, enough homes will be outfitted with digital cable radio that no one will care much about DAB anymore.

Here's a checklist that will either help propel us into the future or shame us years from now.

- The Recording Industry Association of America (RIAA) has been up in arms for a couple years about artist royalties. It succeeded in forcing manufacturers to implant anti-copy protection in DAT recorders (holding their market release back to the point of market failure); tried to tag a tax to sales of blank cassettes; and now is complaining to Congress about the millions of dollars its artists will lose when consumers bootleg from new digital mediums such as DAB.

Meanwhile, the RIAA reported mid-year 1992 recording industry sales of \$3.8 billion, "a healthy" 11.33 percent increase over mid-year 1991, it said. In addition, 402.31 million units of music were shipped during the period, a 6.69 percent increase over the same period in 1991. So what's to complain about?

- After the phenomenal success of Boys II Men's "End of the Road," record companies are falling over themselves trying to

generate soundalike "Ooooh-I-love-my-baby" romantic patter. Jodeci and newcomers Shai have led thousands more youngsters to fall in love with their radios. Teens deserve their idols, but must they all sound alike?

- That goes double for rap, which continues to inundate the U.S. airwaves, to the point that the original music form is long diluted. The LL Cool J's and Arrested Development's of the genre—who appear to have a message—are watered down in a pool muddled by empty babble from Wreckx-N-Effect, Kriss Kross and Sir Mix-A-Lot.

I look with longing at the charts of most other nations, whose radio stations have better things to do with their airtime.

- In turn, it is not surprising that country radio is enjoying its greatest U.S. successes ever—and deservedly so. The past five years have seen a revolution of new talent hit the borders of Nashville.

Ones to watch: Pam Tillis, a singer/songwriter with vision and cunning; Mark Chestnutt, the George Jones of the long line of young, male traditionalists; and Mary Chapin Carpenter, next in line to the crown Reba McEntire currently bears.

- Rock of Ages: Wrinkling rock stars are *in* again, thanks to the rejuvenated success of Eric Clapton, who sounds and looks better than he has in years. Unfortunately, Mick Jagger and Paul McCartney took notice and followed with their own releases. Shouldn't someone unplug them for good?

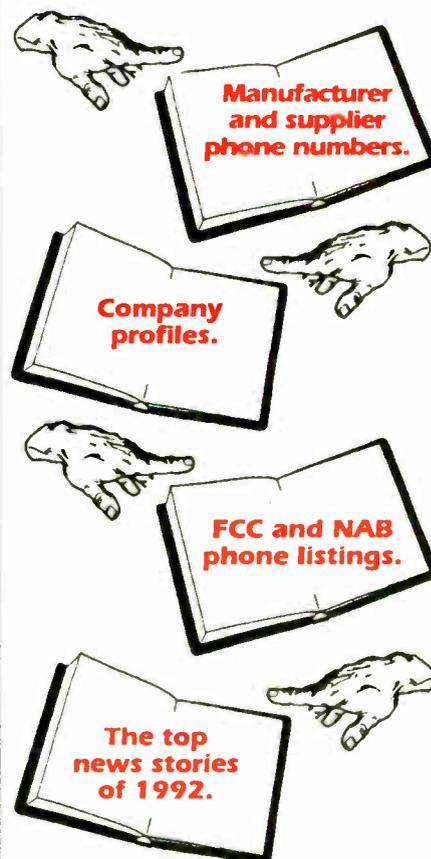
- Perhaps it could be Whitney Houston, who's made 1993 her year and quieted talk that her star was dimming. After faltering with lackluster material in recent releases, she's got one of the biggest hits in history ("I Will Always Love You") and an album that's gone No. 1 worldwide. Critics hated

her in "The Bodyguard," but \$100+ million in U.S. ticket sales and packed theaters across Europe tell a different story. It looks like Houston just bought herself a ticket to the future—not a bad gift for husband Bobby Brown and newborn baby.

- Meanwhile, Madonna ran out of gimmicks following the release of her dirty book, "Sex." The volume set sales records, but burned-out consumers turned a cold shoulder toward her "Erotica" disc. Then her movie, "Body of Evidence" crashed at the box office. Lesson: Maybe you can't have it all, but isn't Music Icon enough?

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TECH TALK

FCC's STL Deadline Set For July

by Judith Gross

EAST ROCKAWAY, N.Y. Sorry—no excuses. You've had plenty of time to plan for this one, and you can't expect the FCC to let you off the hook at the last minute.

We're talking about the July 1 deadline for type-notified STL equipment. And if you're a member of Procrastinators Anonymous who is thinking, "Gee, I have lots of time," have you considered the time it takes to order, receive and install new equipment?

There are good reasons to believe that those lackadaisical souls who keep shoving this one on the back burner may feel the heat themselves in the end. So, without further delay and without getting too much into the technical details here is everything you need to know about the approaching STL deadline—but were too busy to ask.

Q: What is this rule anyway?

A: It's a modification to section 74.550, commonly referred to as "Part 74" which includes studio-to-transmitter links (STLs) in the 950 MHz band (microwave STLs). The idea is to make sure these transmissions are taking up only the amount of real estate they should, since the band has become crowded.

The way to insure this is for the FCC to put its stamp of approval on STL transmit-

ters, which it does by inspecting specific products submitted by the manufacturers and declaring them "type-notified."

Q: What are the chances of getting an extension on the deadline?

A: Virtually non-existent, and the reason is simple. The changes were approved back in the late 1980s, due to take effect July 1, 1990. But that deadline caught the industry unaware (not to mention in the midst of an economic downturn) so the Society of Broadcast Engineers, among others, petitioned for an extension in the spring of 1990. The FCC said, "OK," and the deadline was put off for three years, until this year.

The FCC's William Hassinger says any more extensions are "not contemplated." Translation: "No way."

Q: Do I have to have the type-notified equipment on the air on July 1, or just have proof that I intend to purchase it?

A: Nice try, but no loopholes here. I asked Hassinger point blank and he said type-notified equipment should be on the air, or the station will need to have a very good reason why not. And "the dog ate my type notification" will not be considered a very good reason.

Q: What are the STL manufacturers doing to make things easier on me?

A: Fortunately, a lot. The three major manufacturers of microwave STLs are all offering money-saving deals to buy new equipment and/or upgrade. They have also been diligent about notifying users about models which won't meet the type-notification requirement.

All of Marti STL-10s are type-notified. Some have the ID numbers and others do not. If yours doesn't, contact the company (817-645-9163) with the serial number of your unit and they will send you a new label.

Marti STL-8s are also type-notified, but there aren't stickers for this one. Marti will send you a copy of the notice to post near your transmitter if you call. And a new Marti, the STL-15-C, has its type-notification pending.

If you want to replace an existing composite STL transmitter (even if it is not a Marti) with this new model, and if this is a standalone sale, you can get a \$250 rebate when you send Marti your old STL transmitter.

TFT has also announced rebate offers. STLs from TFT that meet the type-notification requirement include the 7700B, 8300, 8600, 8600A, 9100 and 9200. The 7700 does not. But no matter what STL you currently own, even if it's another brand, TFT will give you \$350 towards the purchase of its 9100A or any TFT composite STL if you take advantage of the offer by June 30 (408-727-7272). Plus, if you want to add TFT's DMM-92 and make your STL digital, TFT will double the offer to \$700.

Moseley also has a dollar offer to help you buy a new STL. The Moseley PCL 606 does meet the type-notification rule, but doesn't have the ID sticker. Call the company (805-968-9621) and fax them an application and they will send you a sticker.

The Moseley 6010s and 600s all meet the rule, but some 505s (pre-1984) may not. If you aren't sure, just give the com-

pany a call. Moseley's older models (101, 303 and 404) do not make the cut and are not being upgraded. But Moseley will give you \$500 back on a new PCL 6010 (contact your local distributor) once you send them your old 505.

Q: What about other STL brands?

A: Dolby (415-558-0200) is new to the game with its digital STL, so there's no worry there. Bext (619-239-8462) says all of its STL transmitters are type-notified. And Micro Controls (817-295-0965) notes that its PTS-10C and PTS-10N made after Jan. 25, 1990 meet the requirements. Older units will be upgraded to comply for a cost of \$450.

Q: Will I see any benefits from the new type-notified STL transmitters, besides a pat on the head from the Commission?

A: You might, especially if you also replace your STL receiver. You might notice better signal-to-noise ratio and better stereo separation. And if you go with one of the new digital models from Moseley, TFT or Dolby, you'll get the additional digital benefits as well.

Q: Do I also need to replace my backup STL?

A: Well here's where the Commission has decided they might give stations a break. The FCC's Hassinger said, as **RW** went to press, that the Commission was considering letting stations use their old, non-type-notified STL transmitters for backup.

He noted that the FCC was "exploring the feasibility" of such a move. Keep reading **RW** for an update as the deadline gets closer.

There. That wasn't so painful, was it? You can upgrade your equipment, you might improve your sound, and you can even save money on a new STL purchase in the bargain. That's what you get for not waiting until the last possible moment.

□□□

Judith Gross is a New York City-based writer.

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PROMO POWER

Personal Touch Adds To Station Promotion

by Mark Lapidus

WASHINGTON Stations that play great music, employ charismatic jocks and execute amazing contests may still lack one important element: personal touch. This is where station events enter the picture.

Being known in your market as the radio station that's everywhere has a lot of advantages. Among listeners it can reinforce top-of-mind awareness and create a larger-than-life picture. Advertisers love event-oriented stations because any exposure for you ultimately translates into consumer awareness of their products.

Covering the basics

We've already discussed how non-profit groups can help you put events together. For the purposes of this article we'll assume the event's ready to go. Now let's get you ready:

Be prepared: with a capital H. The "H" is for help. That's what you'll need if you drive fifteen miles to an event that starts at 7 a.m. and discover that you have no banners, microphones or prizes. Develop a checklist of everything you must bring along.

No matter how many years you do events, you'll never remember every little item unless you write it down. It's a good idea to have a standard list to re-use. Good copy it each time and add items that are applicable. Carefully go over the list with your crew to see if there's anything you've forgotten.

Hire help: Get enough part-timers that do nothing but help you during the event. These folks focus strictly on station promotion and visibility, not event activities. You may need a lot of people for set-up and then fewer helpers while the event is in progress and for teardown. If it is a huge event, you're better off having extra helpers at a few dollars per hour than missing an opportunity when you must accomplish a task quickly.

What's your sign? Station banners should be everywhere. If you have an inflatable mascot, put it up an hour before any activity starts. If it's a huge crowd, think about having a banner flown over the venue. (A competitor did this to me once at a concert attended by 55,000 people. The only problem was that they misspelled their call letters).

If there's a brochure being passed out (as is done at many county fairs) make sure you've got an ad or logo prominently displayed. Other cheap items for your logo include cups, plastic bags and cardboard garbage bins.

Make it professional

Sound-off: Be loud, proud and in the crowd. Since you're in the business of making sound, whenever possible play a tape of your radio station at a volume loud enough for people to know you're there. It's best to make cassette tapes containing your station IDs after every two of your best testing songs.

Don't include spots of DJs. The only time the crowd will hear a DJ is when one of your personalities at the event does live announcements. If done correctly, the audience will probably think you're broadcasting live even though you're not. Some stations just play the radio station, but

commercial breaks at loud volumes sound ridiculous and may broadcast a spot for a client that directly competes with the sponsor of your event.

Decorum & Appearance: Some personalities never learn that they're really in show business. They need to look and act the part. If they're hosting a black tie affair, they have to be in a tux. When hosting a 10K race, the staff should wear casual slacks and a nice station shirt with a collar.

Talk to your talent and crew about what they plan on wearing so you're not surprised. Avoid anything that has a logo on it that isn't yours. Last year a station lost major business because an intern wore a competitor's beer logo to a party sponsored by another beer.

In addition, now that they're all dressed up with a place to go, discuss behavior with your talent and crew. The usual rules of the workplace are still in effect. Do not allow drinking of alcohol or eating in public. It's important that workers not become part of the party; if necessary, give them hourly breaks.

After making their various announcements talent needs to meet and greet as many people as possible. This has a lasting impact on people. At larger events, consider renting walkie talkies. There's nothing more important than being able to communicate with your staff. If at any given moment you need to have something happen, you must be able to reach your people.

Thanks for the memories

Take still and video cameras to record your presence for sales propaganda. Get shots of the station/client banners and crowds sampling products. Take a cassette deck and record crowd reactions for later playback on your own airwaves. Participants' reviews of their experience at the event sound great on the air and can be used the following year in pre-promoting the same event.

The party's over: After tear down, cleanup and storage of your promotional paraphernalia, have a brief follow-up meeting to discuss how people felt about the event and how you may have been able to improve. In memos, voice-mail or staff meetings, recognize those employees that contributed.

What about making money? You may use events as merchandising opportunities to obtain buys. Perhaps you can charge a client for putting in an exhibit. If you're doing a half-price fair, you should receive a cut of the door from the promoter. Every event has a different angle, so selecting the proper avenue for financial benefit is usually done before committing your resources.

Don't forget to ask the big three event questions: 1) Does it have promotional significance and participant benefit? 2) How do we make money? 3) Do we have the resources to do a good job?

Now to prepare for the event, remember the advice of The Five Man Electrical Band... "Signs... signs... everywhere... a sign... do this don't do that... can't you read the signs?"

□ □ □

Mark Lapidus is promotion director for Group W's WCPT(AM)-WCXR(FM) Washington.

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Gateway Recordings Releases CD Set

FT. LAUDERDALE, Fla. A collection of professional digital and stereo sound effects is available in a five-CD box set (SFX-CD-3) from Gateway Recordings. The set contains hundreds of digital and stereo sound effects including nature, horror, combat and sports.

The CD set comes with the "Handbook of Audio Visual Production" that details specific microphone placement techniques, tips on tape editing and mixing with sound effects, monitoring skills, basics on shooting a movie and filming with sound. The handbook includes a chart on the specifications of some audio equipment currently available.

Each CD in the set can be purchased separately. The set sells for \$49.98.

For information, contact Jennifer Palo at RTV Communications at 305-922-8020; or circle **Reader Service 130**.

Mad Dog Wireless Introduces FaxPress

LAKE HAVASU CITY, Ariz. A new service for stations, utilizing the fax machine, has been introduced by Mad Dog Wireless. FaxPress is a service that combines "news they can use"—local stories, stock market reports, weather, sports—in a newsletter-type format that is designed to promote goodwill for the radio station.

According to Rick Murphy, Mad Dog Wireless president and inventor of FaxPress, "I was looking for a way to

reach my customers on a daily basis that would be both inoffensive and cost-effective. FaxPress was born when I realized that I had a valuable commodity—namely my news staff—already in place, who could communicate with area business people."

Mad Dog Wireless will customize a fax layout to reflect the station's image and needs. The company staff handles all requirements, including the insertion of financial information as well as business briefs and tips.

The finished product is faxed back to the station for distribution through a FaxPress computer program and equipment supplied by Mad Dog Wireless. FaxPress is available on a market-exclusive basis.

For information contact Rick Murphy at 800-582-7625; or circle **Reader Service 54**.

David Bowie on Unistar

NEW YORK "The David Bowie Story," a three-hour radio special on the music and career of David Bowie, is available for broadcast May 21-23, following the April release of "Black Tie/White Noise."

"The David Bowie Story" includes Bowie classics such as "Space Oddity," "Ziggy Stardust," "Suffragette City," "Rebel Rebel" and "China Doll" as well as his personal observations on his music and career.

For information contact Renee Casis at 212-373-4968; or circle **Reader Service 85**.

Media Designs Serves Radio Stations

NEW YORK Media Designs, a design firm, is expanding its video/film operation to include commercial TV production for radio stations. Patricia Kesner, formerly with ABC Radio, will spearhead the new division as vice president of marketing.

The company recently completed two TV campaigns, one for AC-formatted WASH(FM) Washington, and one for co-located, all-news, WTOP(AM). The WASH commercial focuses on attracting new listeners to the important mid-day daypart, and targets the at-work listener. The goal for WTOP is to remind listeners to tune in for news, weather and traffic.

For information, contact Patricia Kresner at 516-367-2600; or circle **Reader Service 154**.

Soundquest Media Productions Targets Radio

SOMERSET, N.J. Soundquest Media Productions is the newest player in the radio production business. The company specializes in professional IDs, imagers, promo productions, and other related productions.

The company employees each specialize in a different aspect of radio production. Company president Dan Dzikowski says: "My voice talent doesn't do production and my production staff doesn't do voice overs. I keep each person's abilities separate."

For information, contact Dan Dzikowski at 908-627-0376; or circle **Reader Service 129**.

Music Channel One to Debut

FAYETTEVILLE, Ark. Music Channel One will hit the airwaves on August 7, 1993. The CD-quality, satellite-delivered format is a mainstream contemporary hit channel originating

from KMCK-FM Fayetteville, Ark.

The service will be available M-F, 6 p.m. to 6 a.m., and 24 hours on Saturdays and Sundays, on a market exclusive basis. Stations can sign up for \$200 a month. The station can use eight minutes of time per hour if needed for local sales.

The equipment costs include: \$3010 total cash or \$150 cash per month for 36 months. The equipment includes a Comstream ABR 200 digital audio receiver, a 1.8 meter antenna and a PLL LNB down converter.

For information contact George Hochman at 501-521-5128; or circle **Reader Service 91**.

60 Years Ago

Reprinted from Radio World May 1933. Editor's note: The RW of old, printed for a time in the 1920s and 1930s and today's RW are unrelated except in name.

General Electric Enters Automobile Set Field

An automobile radio receiving set with dynamic speaker, all contained in a single metal case no longer than the average automobile heater, which can be attached to a car with but one bolt, has been developed by engineers of the General Electric Company. A remote control box can be clamped in any position to the steering post or on the instrument panel, within easy reach of the driver.

Ignition interference has been taken care of by the double shielding of the vibrator power supply, complete shielding of the entire apparatus and the use of a tone control which makes it possible to reduce noises that persist in exceptional instances.

The set is mounted on a single stud and necessitates boring only one one-half inch hole in the bulkhead of the car. A new vibrator type of B battery eliminator is employed. Three of the four tubes are of new type: a radio frequency exponential pentode, type 78; a seven-element type 6A7; and a duo-diode pentode, type 6B7. The output tube is a type 89. The use of tubes with multiple functions result in seven-tube performance from a four-tube set.



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UPLINK

Satellite Networks Provide Quality

by Karl Baehr

ALBUQUERQUE, N.M. One of the biggest gripes I've heard for the longest time is "Satellite formats are too generic." Well if you think about it, with clients in four or five different time zones and hundreds of different markets, they have to be to a certain degree.

The key is not whether they are "generic," but rather how you at the affiliate level can localize the presentation for your market. Let's start with what many affiliates believe to be the answer: live local dayparts.

Keep in mind that your satellite network is a live presentation. It is not pre-recorded or taped. We want to discuss locally generated programming, and if not done correctly, local dayparts can kill you. "We need a local morning show" is a fallacy. You do need local elements, and perhaps a local daypart is merited, but be very thoughtful and careful in your decision making and initiation of local dayparts.

Satellite networks provide in varying degree for local dayparts. JSA will provide actual music libraries, others playlists. Unistar provides playlists two days in advance via a data channel that feeds a printer at the affiliate. All networks are willing to assist with localizing.

The networks, as a general rule, provide a higher caliber of talent than is perhaps available in your market. If you put on a local talent that does not mesh with the

rest of the lineup on the network, you could damage instead of help yourself by localizing.

The nice part is that a satellite format should save you enough money that you can pay a little more for better talent that may work in nicely on your station. Be very deliberate in your decision making and go to your network for help.

Phil Barry, VP Operations & Programming, JSA Satellite Network: "We do encourage affiliates to consult us before initiating a local operation. We do recognize the importance of well done local programming, but it is important to find out why an affiliate would want to do a local daypart.

"It's better to work within the network windows and insert local elements for new, sorts, traffic and remotes. We are more than willing to help an affiliate localize, call us."

Robert Hall, VP Programming, Satellite Music Networks: "Local dayparts are tricky. They have to be done right in order to be effective. If they aren't, they can hurt. I encourage any affiliate to contact us during the decision making process when considering local dayparts or elements, our guys love to help."

Neil Sargent, VP, Unistar: "If you can do it better than we can do it and you need the avails, do it.

"Make sure you keep the liners fresh and by all means don't localize until you are

convinced you have the local/network interface down pat. Too many people get in a rush to localize. Talk to us, we will do whatever it takes to do the job for you."

Another viable alternative that requires fewer bucks and headaches would be the insertion of local *elements* into network programming. No one will dispute the importance of local involvement, but again concentrate on the quality of execution on the air.

Local news is the first element that can be a strength. If you have a local TV station, hit them up for a co-promotional tie-in with one of their news personalities. This can not only create, for all intents and purposes a "free" news department, but a promotional avenue for your station as well! These are easy to do, and just because the TV station might have a personality on another station does not rule them out of the game. Chances are they have more than one anchor/reporter. The local newspaper may offer other options for news talent.

Once you have established your news tie-in, have your network feed you introductory liners for the newscasts. Make sure you keep these fresh, several different versions etc.... Also find out from the news source who is most likely to replace this person if he/she is not available. Have liners cut for these folks as well. News jingles/beds are also a good idea and can offer an easy way to intro the news and establish a "news identity" for your station.

Other local elements can include: events calendars, (call a local magazine, newspaper, performing arts organization, etc...for possible talent); business news/events (Chamber of Commerce, local business organizations such as Rotary Club); local health program (a local hospital/MD); legal "briefs" (lawyer), and computer minutes (computer/business supply store). All these offer quality localization, and built-in sponsorship potential.

Though regular traffic reports may or may not be important in your market,

periodic road conditions that are construction, accident- or weather-related can be. You can tie in a local insurance agency, auto club, car dealer, auto parts store to sponsor these as they develop.

Note: If you are not producing these elements at your station make sure you have/install a good telephone hybrid. If you are producing these elements at your station, make sure the production quality is good. This point gets back to not wanting local elements to sound out of place on the air.

As far as producing special features, news, weather or traffic beds, there are many choices for production libraries or jingle companies. GMI has a good, cost effective production library called "Lazer Toolkit" that can get you rolling. Call Ron Erak at 800-937-8250. Thompson Creative produces some of the best jingles/music elements I've heard recently. Call Glo Jenkins at 214-559-4000. You may have local options for production as well—find out who the advertising agencies and larger regional advertisers use for their commercials.

Once you have made all your well thought out decisions and initiated local elements/dayparts on your station don't forget your network. Last year we touched on affiliate/network relations. Send the network your airchecks and solicit feedback. The idea is to be partners in success.

Unfortunately, many satellite affiliates treat their network like the local electric company.

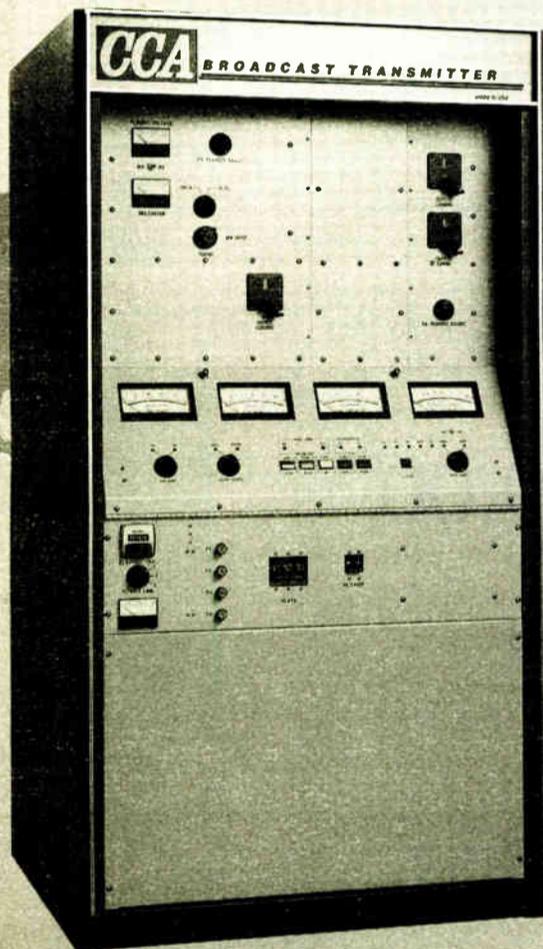
Next time, I'll talk about doing remotes on a satellite station.

□ □ □

Karl Baehr is president of KBE "Broadcasting By Design" a radio consultancy that provides support services for satellite radio stations. The company also produces the Actual Radio Measurement (ARM) electronic survey system, and is involved in the development of Radio Tropico Internacional, a proposed tourist oriented satellite radio network in Mexico. Baehr is a former radio programmer and air personality, currently pursuing a graduate degree in Mass Communication at the University of New Mexico. He can be reached at 505-828-0488.

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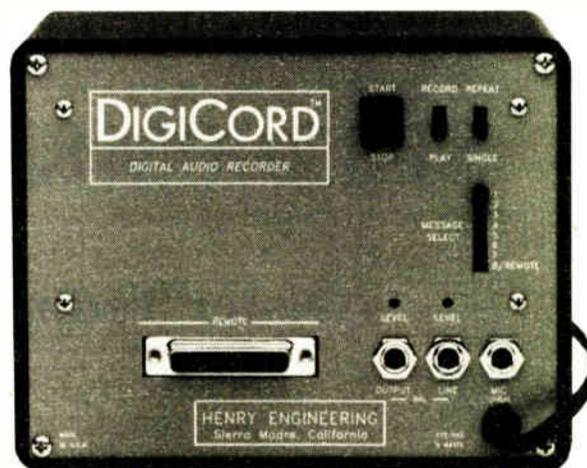
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Drive-Time Programming For Success

by Mark E. Walker

BENTON, Ark. In the pre-World War II era, radio reached its highest peak of popularity. The family would gather around the radio for an evening's entertainment. Programs would include variety shows, adventure serials, and music shows, often broadcast live. There was no evidence of programming or formatting in radio's infancy. Radio broadcasting was geared toward mass appeal, unlike it is today.

In the 1950s television emerged as a medium with enormous mass audience response. Technology made televisions less expensive and readily available to the average consumer. Early television broadcasts tended to be live radio with pictures and required less effort to enjoy because it involved less imagination. As more and more homes gravitated toward the television, radio suffered an enormous loss of its audience. Radio was scrambling to find its audience again and that is how formatting and programming were born.

At that juncture, radio devised a new strategy which targeted a specific segment of the listening audience. This strategy is called specialization.

Drive-time strategies

There were over 10,000 radio stations broadcasting in the U.S. at the end of 1990. There are probably as many different strategies for programming as there are radio stations. With so many different programming strategies, can common characteristics be recognized among successful stations?

It would be difficult to compare the programming of all the stations in a listening area. So, to effectively compare drive time programming, the ideal focus has been placed on a given broadcast hour from three successful radio stations. This analysis will focus, then, on three Little Rock stations: KURB-B 98.5; KMJX-MAGIC 105; and KSSN 96 FM. All will be considered in terms of their respective afternoon drive time broadcast hour of 5-6 p.m., M-F.

KURB-B 98.5

KURB(B 98.5) is still a relatively new station in the Little Rock market programming. An Adult-Contemporary (hereafter referred to as AC) format with with a strong ratings history.

KURB's music playlist consists of popular music from the 1980's and today. "Our playlist is limited, but the songs are research-tested hits. With a smaller playlist, a listener is more apt to hear a favorite song when he tunes in," explained Randy Cain, program director. As with most AC stations, KURB's target audience is the 25-54 year old listeners.

The programming strategy for B 98.5's afternoon drive time does not differ from the rest of the day (excluding Craig O'Neill's morning show.) By programming longer blocks of music between commercial breaks, Cain hopes to train listeners to stay tuned during the commercials. Cain reasoned, "If the listener knows that after two minutes (of commercials), they'll hear four to five songs in a row, they are more apt not to change stations. Hopefully they will stay through (the commercials) in order to hear the music."

Since Adult-Contemporary is primarily a

music-oriented format, the role of announcer is not as prominent as it may be elsewhere. Kevin Miller is B 98.5's afternoon Air Personality or Disc Jockey. On-Air announcing is kept to a minimum and used only when necessary, as with weather and station identification. In essence, they let the music carry the station. B 98.5 programs in sweeps (long segments of music) to showcase the music.

The majority of Adult-Contemporary stations commonly schedule commercial breaks at twelve to fourteen minutes intervals, as is the case with B 98.5. Their commercial breaks rarely last longer than three minutes.

Cain stresses the importance of spot

position, or the placement of commercials in a break. He believes the most entertaining, upbeat commercial should come first, to keep the listeners attention. The softer spots should be held to latter slots, for obvious marketing reasons.

As Program Director, Randy Cain's main concern about the future of programming focuses on format fragmentation: "More stations are narrowing their target audience, trying to find the listeners which the advertisers want to reach. Stations are limiting their target audience to a specific niche. We target the 25-54 listener, but one day that may be too broad." For now, KURB is doing well in the ratings (they are forth in the

12+ category), and that is something about which Cain is exceedingly happy.

KMJX-MAGIC 105

"Magic 105 has rocked hard since day one," said Tom Wood, program Director at KMJX, as he reflects on the station's history. Indeed, KMJX has been "rocking hard" since its inception in 1980, and Tom Wood has been programming the station since that time. Magic 105 is an Album Rock station, specializing in a blend of classic rock from the 60s and 70s seasoned with more current rock from the 80s and 90s. "We have an advantage in Little Rock, being the only station programming Album Rock. Our listeners tend to be very dedicated," Wood believes.

Perhaps no other format places as much

continued on page 23 ▶

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Trying To Make The Right Decision

by Sue Jones

BURKE, Va. Making a decision can be the pivotal point in any career. We all want to make the right decision 100 percent of the time. That is not possible, but there are some guidelines that can assist you in making solid decisions whether you are dealing with a resource management, new promotions, or improving profits.

Before deciding on a course of action, define the problem. Make sure that you have a clear understanding of all aspects of the problem. If profits are down, take a look at the probable causes from as many different angles as possible.

There could be several things influencing lower profits. There could be dependent influencing factors. A low staff morale could be impacting your sales staff's performance therefore reducing revenue.

Collect data

Gather information about the problem from as many sources as you have the time and ability to do. Knowing more about a problem will improve your ability to decide on the best course of action.

Determine whether it is an ethical problem or a business decision. Distinguishing this point will determine how/when/if you will commit resources to resolving it. Ethical problems are often personal decisions that you must make for yourself and or may involve the FCC or the station's standing in the community.

Is it a case of conflicting interests or a question of rights and fairness? Confusion with these two points are common in resolving conflicting personnel problems and operating procedures. Too often the decision is made in favor of the loudest group (person) rather than a decision that could benefit the whole.

Who can help? Sometimes an expert's advice or thoughts can be helpful. If you are dealing with a decision about purchasing new equipment, seeking information from your engineer or other professionals familiar with that type of equipment may be helpful. Call names on a users list. Talk with other general managers of other stations who may have purchased similar equipment recently. He or she may be able to give you pointers on things to check before you buy and install.

Whose problem is it? Before you leap into solving every problem that comes your way, ask yourself if this is really a decision that you should make. Could it be handled by a subordinate? Are you making all of the decisions at the station? Re-routing problems to their proper management level will improve managerial and supervisory skills and keep your work load at a manageable level. Conversely, should the station owner be involved or making the decision?

Who is affected? Make sure that you have considered all those who are affected by the decision. Implementing a new incentive program that is limited to the

sales staff can contribute to low moral, and polarization of the staff. The thought that only sales people need motivation is not true.

Think it through

If you are faced with the decision to downsize (or right size) have you considered all alternatives? Could you save money in another part of your budget to offset laying off an employee? Could you cut back with natural attrition and closer control of the budget?

Reduce the number of alternatives to a manageable few. Most of the time, there is not one right decision. Many times the decision comes down to "what is the best alternative." Some decisions must be made as a process of elimination. If you need to improve your ratings, collect the best ideas and work with the manageable few that are feasible for your station.

Having too many solutions may make the decision impossible and result in a worse problem of no decision. Once you have reduced the alternatives to a manageable few, you can begin to compare the advantages and disadvantages of each one. Weighing three alternatives is far easier than weighing ten alternatives.

Given each alternative, ask if there is a law against it or if it is a violation of a clear moral rule. Our news headlines are full of examples of private and public sector managers who did not ask this question or think about the penalties. On legal issues or those that could result in a lawsuit, consult your legal counsel. If in doubt, consult your legal counsel. Bypassing legal advice on a questionable matter to save money at the decision point could be far more costly in the future if a lawsuit must be settled or fought in court.

What price to pay?

Violations of moral rules can create spin-off problems. If you are openly having an affair with a subordinate staff member, the staff will be forced to respond to each per-

son involved in a different way than if no relationship existed. Keep in mind that you will respond differently to the other person in the relationship.

Typical responses include favoritism (real or perceived) or unfairness. While there is no law against mutually consenting affairs with subordinate staff members, it usually creates additional tension in the office, sets an example for others, and generally is a no-win situation, long-term, for all concerned. Very few people who get involved with inter-office affairs consider what the work environment would be like if the relationship goes sour.

How does it make you look? Consider two levels here, yourself and the station's image. Consistent systematic evaluation of problems with staff or outside counsel will create one type of management image. Inconsistent, superficial evaluation, or spur-of-the-moment approaches to decisions will create another image.

You are building your career and developing management talent and skills. Too many decisions that are poorly thought through, do not solve the problem.

Of course you must always be mindful of the station's image and format. These things affect ratings and profits. Accepting a lucrative ad campaign that might be offensive to some of your listeners may have short term impact on your profit line but have a long term impact on reduced listeners and ratings.

Not all decision are good ones. That's OK. It is impossible to make the right decision every time. You may not be able to gather all of the facts before you are forced to make the decision. The missing fact could cause what seemed like a good decision to turn out bad. You may have been incorrectly advised or made a decision at a moment when tempers were hot or persuasive pressures were applied. Make the most informed decisions you can make at the time considering the circumstances.

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Sue Jones is a senior manager for Computer Data Corporation, Inc. in Rockville, MD. She can be reached at 703-323-0491.

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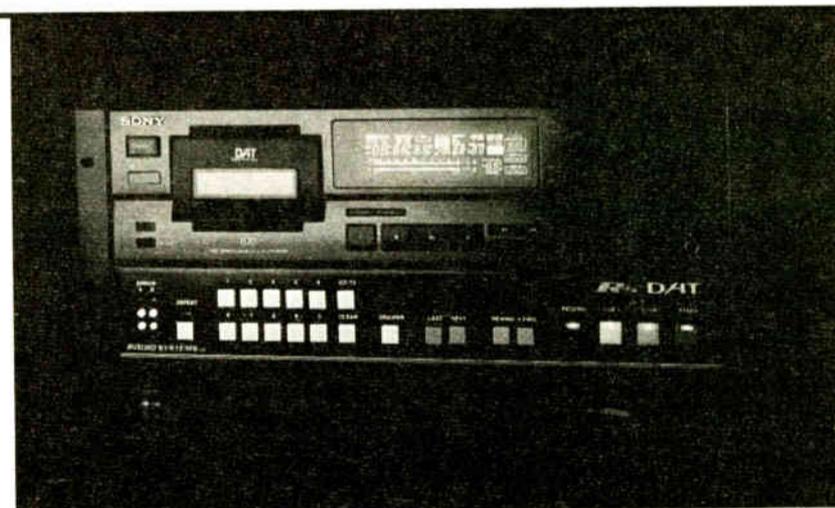
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Drive-Time Programming: Commonalities for Success

► continued from page 21

importance on music as does Album Rock. "We play at least 50 minutes of music an hour. Not only is the music itself important, but music selection and placement also play a big part. For instance, what might be a good song to play at 12:15 p.m. might not work as well at 5:20 p.m.," Wood explained. The music playlist for MAGIC 105 is considerably larger than most stations, as it should be, considering the larger time span of music they cover (1960s-90s).

MAGIC 105's afternoon drive features the "Traffic Jam" provides almost an hour of continuous music in an attempt to keep listeners tuned in. "Little Rock's largest group of employers are housed in the state offices and hospitals. Their shifts end earlier than most others, and we try to target them in the afternoons," said Wood. KMJX targets the 25-54 year old listening audience, but they are also concerned with developing a younger listening audience as well. "In addition to the classics, we also program a lot of new music," wood explained. "If we can attract a listener that's in his teens, hopefully he'll mature into our 25-54 target audience." A successful station is always concerned with keeping up with its audience, and vice versa.

News in the afternoon is not a factor at KMJX. "We don't program news after

8:50 in the morning," Wood stated. Album Rock stations that downplay news usually have disc jockeys assume the news castings duties during their shift. MAGIC 105 follows this belief.

David Alan Ross is MAGIC 105's afternoon Air Personality. His shift is from 2 p.m. to 7 p.m. and contains the popular "Traffic Jam." Wood believes David Ross fits Album Rock announcing "to a tee." "David is a real meat-and potatoes disc jockey. He says what needs to be said, and then he's back into music." In an afternoon drive, that seems to be an asset. The less a disc jockey talks, the less likely it is that a listener will change to another station. The same is true with commercial breaks. "I have to program ten minutes of commercials an hour," Wood said. "With the Traffic Jam being a long music sweep, the commercials break at 5:30, 5:40, and 5:50 p.m. have to be longer."

Tom Wood's main concern with the future of programming is the incorporation of new music. "There's so much new music out there, with bands like Nirvana and Pearl Jam. It's challenging to me to find a place for it. How do you convince a listener to accept music other than the classics they love? It's very challenging." MAGIC 105 and Tom Wood seem to have met that challenge so far. They are celebrating their 12th successful year (KMJX

ranked second in the latest Arbitron Ratings) and are still "rocking hard."

KSSN-96 FM

Stations have been programming country music since radio's infancy, but it has never been as well received as it is today. Country music is the most widely programmed format in the nation. No other format can boast of a more loyal following. KSSN 96 FM is one of those stations. Arbitron Ratings from the summer 1992 show survey KSSN with a phenomenal two-to-one lead over its nearest competitor. Don Moore, Program Director and Afternoon On-Air Personality, is proud of KSSN's success.

"We have had several all time high ratings books since I have been here," Moore said. KSSN was chosen as Country Music Association's Medium Market Station of the Year for 1991. "The popularity of country music has evolved; the demographics have spread out so incredibly," Moore explained. "We still focus on the 25-54 year old listener, but it has spread out where it is accepted from birth to death." Moore believes the music is the most important element in programming.

KSSN can be referred to as a Contemporary Country station, with a strong focus on current artists' songs. "It used to be that most stations played a ratio of 35-40 percent current material," Moore stressed. "More recently we have trimmed our music library to be more of today's country." KSSN's playlist of songs is based on the current it charts, but older songs still play an important role. Although music is a major factor at KSSN, it is not the only one

that concerns Moore. Unlike other stations, KSSN places a strong emphasis on news in their afternoon drive time.

The majority of country stations offer news coverage through-out the day, not only in the mornings. Moore believes news is a must for the KSSN listeners. "In drive-time we are heavier news, heavier weather and time. When you are dealing with an older audience, the want and need for news is a little higher." Although KSSN programs news updates in the afternoon drive, they limit it to one update an hour.

Moore pays special attention to the placement of commercials in each break. "The spot closest to a song would go first. Something that is least likely to be a tune-out factor," explained Moore. "We try slide the listener through the break, so that by the third commercial they know we will play a song soon and they will not change stations."

The future of programming, according to Don Moore, lies in live radio. Moore believes a live station will always have more listener appeal than an automated station. "With a live station you can stay in tune with your listeners requests, there is not a delay on feedback," Moore explained. KSSN is the number one station in Arkansas (according to Arbitron Ratings) and that makes Moore a very happy and envied Program Director.

Conclusions

So what are the key commonalities when it comes to that at least three general themes emerge:

First, there is not a set formula for programming a drive time hour. The strategies

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SPECIFICATIONS

all tests performed at 1:1 compression

Digital Signal Processing System (DSP)

Sampling System- 16 bit linear PCM, 2 channels
 Sampling Rates- 44.1,32,22kHz, fixed filter on routing switcher
 Compression- 0,2,4...adaptive differential PCM

Controller -

Floppy Disk- 3 1/2" 1.44M capacity, System Hard Disk- 40MB
 Printer Support- IBM compatible, parallel port

Audio Performance- Digital Record playback

THD- .008%, Dynamic Range >85dB,
 Freq Response- (+)(-).5dB 10Hz-15kHz

Physical Specifications

Dimensions- 19" Rack mounted- 19"W x 5 1/4" (3RU)H x 16"D
 Weight- 60lb's , Power- 110/220VAC, 50/60Hz, 100W

Audio Performance- Routing Switcher

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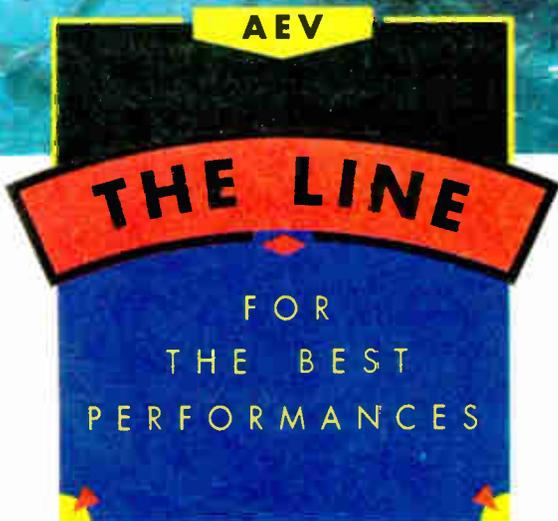
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Circle (151) On Reader Service Card
 World Radio History

Squeezing Out Consumer Compression

by Mel Lambert

STUDIO CITY, Calif. A number of RW readers were interested in my comments regarding the applicability of MiniDisc (MD) and DCC. As I wrote in my January column, while these two recording formats offer consumer users distinct advantages over analog cassette decks they are designed to replace, I have reservations about their wide-scale use by broadcasters.

Don't get me wrong. Without a doubt, MD and DCC are going to catch the interest of the consumer market and offer better audio quality compared to conventional analog cassette formats.

But aside from the sonic degradation that I can hear quite clearly (and which, to be fair, was not too troublesome to many of you during recent trade-show demonstrations; you still might reserve judgement until you can perform AB tests in your own production studios), there is another aspect worth considering in greater detail.

Not for the pros

For single-generation recording and playback, both of these new technologies perform extremely well. But in professional applications, we really do need to ensure that we understand the full implications of living with multiple generations of data compression, tandem coding and the other practical realities.

An increasing number of AM and FM

stations are currently installing floppy-disk recorders, hard-disk/MO-based automation systems, digital STLs and other components that base their operation on data-compression schemes.

This being the case, it behooves all of us to at least calculate the maximum number of stages of encode/decode data compression that might be encountered during the passage from source to air. If this number turns out to be small and predictable, then it makes sense to use data compression.

(Be careful using sequential coding with different types of transform and/or ADPCM-type compression schemes.)

Stations are going to run into problems, however, when the number of generations of sequential coding is high. A major European broadcast organization has determined from listening tests that as many as seven generations of a single, well-known coding scheme might be on-invasive to audio quality. The situation is compounded when different data-compression schemes are used at various stages during a signal's passage from source to air.

We begin to see the magnitude of the problem. I return to my original reservations about MD and DCC. Because of their small size and the nature of the media being used as well as the additional error protection the developers deemed necessary—they are consumer formats, after all—both of these record/playback schemes involve dramatic data-reduction ratios.

Once through that amount of sonic manipulation is enough, I think. Subject the output to subsequent generations of data reduction and the results will be less auspicious.

Who compressed what?

So how is a broadcaster to know how many generations of data compression a particular signal has suffered? Currently,

the only way is to carefully document the type(s) of compression used at each stage in its production and hope that such information remains with the data as it moves from production or air studio to final transmission.

If the label attached to the playback media is sufficiently large—and the engineering staff sufficiently diligent—we might be able to track the process. What makes more sense would be to attach such information to the data itself.

There are sufficient bits within a standard AES3-format signal to encode a great deal of information about the signal's source and production history. When such data can be updated each time, it encounters a recording boundary (such as at the beginning re-recording to a new media or during the data-compression process) then this information could also be updated by a DSP chip.

If recorder, editor and workstation manufacturers consider such additions too expensive for the next-generation systems, I can see a viable market for add-on, PC-controlled interface boxes that could edit/update AES3-format digital bit streams.

In addition, it makes increasing sense to carry data-compressed bit streams over digital interfaces rather than implement an additional stage of decode/encode each time we need to connect the output of, let's say, a DAT recorder to the input of a workstation.

If the recorder is holding data reduced audio, why not simply hose it straight to the hard disk? As long as both components are based on the same data-reduction algorithm, we should encounter few problems.

Specific bits added to the data stream can easily identify the perceptual encoding scheme used on the source and the compression ratio. Such information could then be detected at the workstation's input section and used to make

rational decisions about its fate.

I doubt whether such schemes will be innovated soon. But if enough broadcasters realize that data reduction is a part of the future and that audiences are soon going to notice that the promise of "CD quality" is being compromised by less-than-efficient use of the media, we might be able to prod manufacturers into submission.

I always live in hope.

Postscript

"Jurassic Park," Steven Spielberg's summer release, will feature a newly developed, all-digital playback system that utilizes 4:1 data compression. Around 1,000 theaters are expected to be equipped to play the system.

Digital Theater Systems, a California-based company, developed the special format comprising interlocked CD-ROM drives that play back up to 3.5 hours of multichannel audio. A special timecode stripe added to a conventional stereo optical print provides frame-accurate synchronization to the digital audio soundtrack recorded on CD-ROM.

In the event of a system failure, the output is automatically switched to the backup optical playback. Two replay formats are available: "DTS Stereo" for two-channel, matrix-encoded releases with an additional subwoofer channel, and "DTS-6," a six-channel configuration offering LCR, split surrounds and subwoofer. A single CD-ROM is required for DTS playback and two CD-ROMs for DTS-6.

□ □ □

Mel Lambert has been intimately involved with the production and broadcast industries on both sides of the Atlantic for more than 15 years. Now principal of Media&Marketing, a Los Angeles-based consulting service for the professional audio industry, he can be reached at 818-753-9510.

Drive-Time Programming

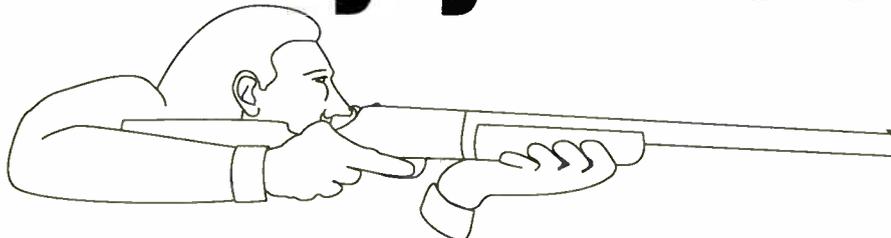
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incorporated by one station's program Director for a particular format may not work in another format. For example, Don Moore's approach at KSSN might not be as successful if transferred to KMJX. There are, however, a few common philosophies shared among the three Program Directors studied in this paper.

One philosophy, and also the second theme, is that commercial positioning within a spot break plays a key role in programming. All three Program Directors agree that the most upbeat, entertaining commercials should be played first, in order to keep the listeners' attention. For example, a commercial sounding most like a song would be played before a spot without music.

The third theme is the idea that music is the most important element in programming. According to the Program Directors in this study, the music a station programs must not only appeal to its listeners' tastes, but also entice them to stay tuned. All three of the interviewees agree that the more familiar the music is to the listener, the better the chance that the listener will not change the station. Commonalities abound, but in the final analysis, stations and their programmers are seizing the opportunity for innovation and improvement every day.

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Circle (168) On Reader Service Card

Niches Now the Rage

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exciting dimension, stereo. I can still remember the initial demonstrations of a ping-pong ball going from left to right; it was amazing. I always believed that the static free reception of FM, the technical advantage would eventually win over the audience. The problem was getting the receivers. There's another very important point in history that people forget, but the development of SCA permitted the development of FM.

RW: Are you saying that SCA helped drive FM to popularity?

Cervon: Oh, absolutely. It kept a lot of

FM stations on the air. They leased their channel to an SCA operator, the FCC allowed that. Without SCA, who knows. That kept a lot of FMs on the air; the only way they were able to pay the electric bill was through SCA.

RW: So where do you see radio going?

Cervon: There is going to be a bit of a shake-out. That is occurring now. But radio will always be here because it is a personal medium. And more and more it will cater to specialized audiences based on ethnic considerations, based on demographics, on cultural and economic interests.

RW: Where do you think DAB fits into this? Do you see DAB coming alive like FM came alive?

Cervon: Well, FM stereo excited me because it gave me something I never had before. I could hear stereo, a new dimension. But DAB doesn't excite me, maybe because of my age, I don't know. But it will probably come about.

RW: Do you think AM would be a lot more alive today if there had been a standard in the 1980s?

Cervon: I wouldn't say a lot more alive, but I think it would be more alive. It's a question of degree. I think the interest in AM would have continued more than it did. I think the negative reaction to the fact that AM was a mono only affected listeners, whereas back 10 years ago, if AM

stereo would have been adopted immediately then I think there would have been an avalanche of stations that would have put it in.

RW: What's changed in the merchandising of broadcast equipment?

Cervon: When I first joined this industry, it was dominated by several large companies that had complete product lines. Like RCA, they made everything. They made transmitters, they made consoles, the whole thing. So did GE, and so did Collins Radio Company, and eventually Gates (now Harris) did.

What I saw happening in the last 15 to 20 years is that the day of these large broad-line equipment manufacturers are pretty well gone. So today what you have is a lot of niche companies. It has become a niche industry. You have companies that are leaders in a specific, specialized field. A lot of people have asked why this is and my observation is there are three reasons.

One, because technology is moving so fast it's very difficult for manufacturers to keep up. Second, there are so many distributors willing to sell you products that it's relatively easy to get distribution. When I first got in the industry, every manufacturer had its own sales force. There was no such thing as an independent distributor. And the third reason is that there are so many product creative individuals today who can start their own companies relatively inexpensively.

RW: Any regrets about retiring when you did?

Cervon: I don't mind telling you I really miss the industry. And I think I retired too soon.

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Business Up At NAB '93

► continued from page 1

tions across the country. The ten winning stations are: KASE-FM Austin, Tex.; KQRS-AM-FM Minneapolis; KZZY-FM Devils Lake N.D.; WLNG-AM-FM Sag Harbor, N.Y.; WUSL-FM Philadelphia; KNNN-FM Central Valley, Calif.; KRLD(AM) Dallas; WGN(AM) Chicago; WTTR(AM) Westminster, Md., and WZWW-FM State College, Pa. At the same luncheon, the "Grand Ole Opry" radio show was inducted into the NAB's Broadcasting Hall of Fame.

The international presence was strong at this year's gathering, with over 11,000 registrants making the trip to Las Vegas from other countries. The NAB continues to look for ways to enhance ties with overseas businesses and broadcasters, and as part of that effort announced the establishment of a cooperative working relationship with the Nippon Computer Graphics Association (NICOGRAPH) of Japan.

NICOGRAPH is the Japanese association of computer hardware and software suppliers and holds an annual convention in Tokyo. The association is involved in the sponsorship of NAB Multimedia World. The associations will exchange memberships and conduct annual meetings of their executive staffs to exchange information and coordinate activities.

Alcohol Ads Hinge On Clinton Stance

by Randy Sukow

WASHINGTON Associations representing the broadcast industry and the companies that advertise on radio and TV are uneasy about the reintroduction of legislation mandating warning labels on all alcohol advertising.

The bill would force advertisers to pay for several seconds of time after each broadcast ad to read a warning—a requirement broadcasters fear could drive alcohol advertising away for good.

Similar legislation failed to get out of committee in the last two Congresses. But there a new factor in 1993.

"The one wild card is that the administration could get involved actively. That could change the calculus," said Dan Jaffe, executive vice president for the Association of National Advertisers (ANA).

The Sensible Advertising and Family Education Act (S. 674)—introduced by Senate Judiciary Committee members Strom Thurmond (R-S.C.) and Paul Simon (D-Ill.)—closely resembles the failed 1992 bill. It requires reading one of seven health-warning messages (see box below) after each broadcast spot.

Representative Joseph Kennedy [D-Mass.], lead sponsor of the House version of the labeling bill last year, is planning to introduce companion legislation to S. 674, an aide says. (The bill had not yet been introduced at press time.)

"The alcoholic beverage industry is presently spending about \$2 billion a year on advertising and promotions in the United States alone," Thurmond said on the Senate floor. S. 674's "costs to the industry would in fact be very small when compared to the savings experienced by the entire country in reduced alcohol-related health problems, crimes and deaths."

That attitude has been far from universal on the Judiciary Committee in recent years. Fellow committee member Wendell H. Ford (D-Ky.), who also serves as Senate majority whip, promised at a 1992 conference of the American Advertising Federation (AAF): "There'll be blood on the carpet before that dang bill gets to the floor."

Most on the committee still feel the same way and chances for passage "are still low," Jaffe said, "particularly in light of the fact that every bottle and can in this country already has a detailed series of warnings" in compliance with a 1988 Thurmond-sponsored act.

S. 674 was introduced with fewer Senate co-sponsors than the earlier bill, which is perhaps an encouraging sign, said Jeff Perlman, AAF

vice president, government relations. But the early inclusion of Simon, who led earlier successful battles for Children's Television and TV Violence bills, could be significant, he said.

But the one that could dramatically change the situation is the Clinton Administration. No one knows what, if any, stand it will take on alcohol advertising, but there are reasons for broadcasters and advertisers to worry. Vice President Al Gore was a co-sponsor was a co-sponsor of the Thurmond bill in 1992.

There could also be a Hillary factor. The Clinton Administration followed up campaign promises to pass health-care reform by appointing the First Lady chair of the committee forming the administration's plan. Some worry that alcohol ad labels or more drastic measures could be among the committee's recommendations.

"I've heard that as speculation," Perlman said. "Anything is possible in this world, but I've not heard it from anyone but sources who were speculating themselves."

"Advertising warning legislation sounds like a reasonable idea, until you look at the issue more closely," National Association of Broadcasters President Eddie Fritts said in a letter to House and Senate members. "The fact remains that it will not accomplish its intended goal and instead will simply drive such advertising off radio and television altogether."

The labeling bill is flawed because it attempts "to solve a social-behavior problem by alter-

ing advertising messages, even though no scientific evidence exists that advertising has any causal relationship to alcohol abuse," Fritts said. The loss of advertising revenue will greatly degrade the quality of radio news, public affairs and especially sport

programming, he said.

S. 674 would impose "a massive expense" on broadcasters, Jaffe said. The few seconds it will take to read the warnings may not seem like a great burden to those unfamiliar with the radio industry, but "clearly if you're doing a 15-sec-

ond or 30-second ad, you're having a very substantial cost," he said. "It's fine for them to say we're going to take other people's money and use other people to do government-imposed public-education programs, but you've got to have a strong justification."

AM In-Band DAB Demo'd

by John Gatski

LAS VEGAS Although skeptics of USA Digital's proposed in-band, on-channel digital audio broadcasting systems were out in force at NAB '93, many of them were impressed with the AM demonstration.

At presstime, the much anticipated FM mobile demonstration was delayed because of a technical glitch in the power system, but the stationary digital AM signal was broadcast within an AM analog signal as promised.

At the USA Digital booth inside the Las Vegas Convention Center hall, listeners heard 15 kHz stereo digital signal and a mono analog signal—both broadcast from an experimental station (KDAB) at 1660 kHz.

Discerning listeners did not get to sample digital audio through headphones, but through the PA speaker arrangement, most agreed the sound was much better than the analog (which was mono and "untweaked" USA Digital admitted).

USA Digital's Michael Smith said the system has improved in sound quality since its debut last year at the NAB Radio Show in New Orleans when it was broadcast as a stand-alone digital signal.

The signal path from the Las Vegas Convention Center to the transmitter and back to the convention center was as follows:

The audio was supplied by an RCS CD jukebox system, which was fed into an Aphex Compellor and then encoded through a CCS-CDQ 2000 MUSICAM encoder. At a 256 kbps rate, the audio data was transmitted to the main transmitter site outside of town via a TFT digital STL.

The signal was then downlinked to the TFT STL receiver which passed the signal to the CCS CDQ-2000 MUSICAM decoder where the analog and digital signals were split. The analog signal was routed through a summing network, an Orban Optimod and then to the Xetron AM DAB transmitter where it was recombined with the digital signal that had undergone another MUSICAM encoding (96 kbps) and the error correction and interleaving process (128 kbps). The combined signal was then passed from the USA Digital/Xetron transmitter at 1660 kHz through an antenna tuning network to the KDAB tower. The analog signal was 200 watts; the digital signal was about ten watts, Smith said.

After the combined digital/analog signal was broadcast from the 252-foot omni-directional tower to the convention center receive antenna, the signal then split for good. The analog was fed into a Kenwood receiver and into the power amplifier. The digital signal went through four more steps: a RF amp and mixer, IF amp AGC and digital carrier recovery (128 kbps), error correction and de-interleaving (96 kbps), and through a CCS CDQ-2000 codec.

Smith said much of the digital signal extraction technology is still in prototype form, but will continue to improve. He said future demonstrations will include mobile tests.

Some engineers have said that the AM in-band, on-channel may be easier to achieve than FM because of AM's natural immunity to multipath—still a major obstacle for in-band FM.

USA Digital's in-band AM systems does not work well with a C-QUAM stereo AM signal—a problem that is surmountable, but would add complexity and cost to the systems, the developers said.

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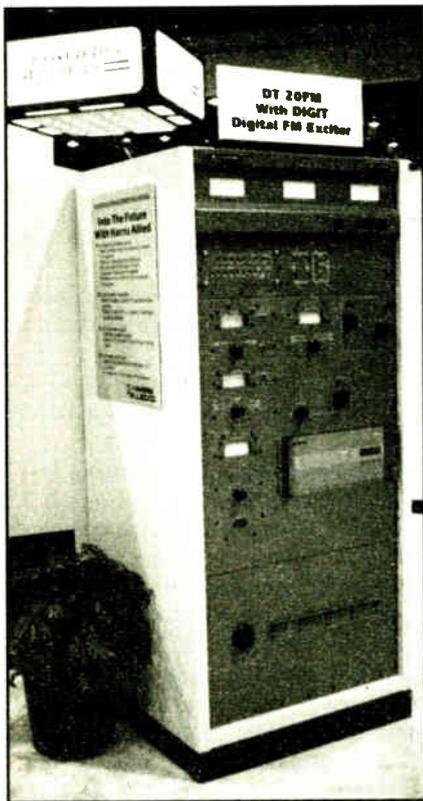
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For complete NAB '93 Convention coverage, see the May 26 issue of **RW**.

Harris Showcases Digital Exciter

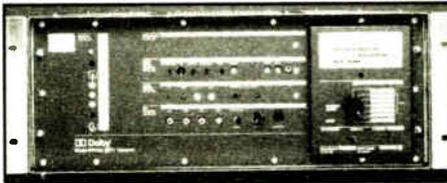


LAS VEGAS A new Harris 20 kW FM transmitter equipped with Digit™, a digital FM exciter, was showcased at the Harris Allied booth.

The transmitter, the DT 20FM, features a field proven single tube/quarter wave cavity design. Other features include an adjustment-free solid state in-line IPA and Harris' FlexPatch™ routing capability for emergency on-air operation at reduced power. The DT 20FM provides PA efficiency in excess of 77 percent for reduced operating costs.

Digit is a 50 watt digital FM exciter with rugged wideband FET (field Effect Transistor) output devices, and operates with 32-bit Direct Digital Synthesis (DDS) precision for performance designed to rival or exceed CD-quality. According to the company, the exciter, available with an optional plug-in A/D (analog-to-digital) converter, can be used to upgrade almost every current FM transmitter.

For information contact Martha Rapp at 217-222-8200; or circle **Reader Service 188**.



Dolby Features Digital STL Products

LAS VEGAS The Dolby DP5500 Series DSTL is a fully integrated 950 MHz aural digital studio-to-transmitter link. It incorporates Dolby AC-2 (patents pending) audio coding and modem and RF technologies. The systems approach taken by Dolby Laboratories in producing a fully integrated DSTL package offers significant advantages by offering increased spectrum-efficiency, greater freedom from interference, and increased fade margin.

Dolby AC-2 which provides the necessary data rate reduction for spectrum-efficient operation in the 950 MHz band, ensures that audio quality satisfies the most critical professional and broadcast applications. The combination of Dolby AC-2 audio coding 9-QPRS digital modulation, and ultra-linear RF amplifier sections, yields an occupied bandwidth of only 400 kHz, while

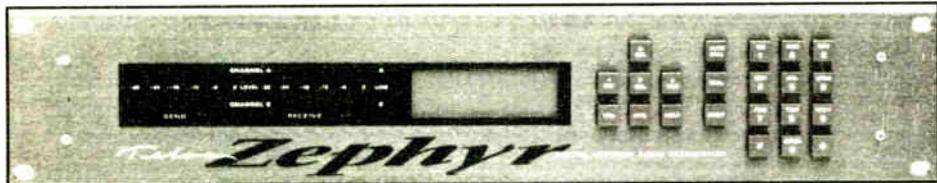
retaining the capability of carrying four program and two data channels.

The tightly controlled spectrum of the DSTL system allows it to successfully co-exist with FM STLs or DSTL systems on adjacent channels. Because digital modulation is used, the system is very robust and operates with no deterioration of signal quality under fade of interference conditions. RF receive levels required for proper operation are much lower than comparable analog installations.

The audio outputs of commonly-used audio processors can be connected at the DP5503 transmitter, and the DP5504 receiver can house an optional digital stereo generator. Thus, users can substitute the DP5500 Series into composite STL installations with minimal disruption. Overshoots are tightly controlled in the digital domain by the DSTL system.

Digital inputs and outputs are provided for digital-to-digital signal transfer between DSTL units for repeater or other specialized operations. Hot standby capability is provided via interface to hot standby units (Models HSI and HS2) available from Dolby.

For information contact Kevin Tams at 415-558-0200; or circle **Reader Service 66**.



Telos Launches Zephyr

LAS VEGAS Telos Systems introduced the Zephyr Digital Network Audio Transceiver, capable of transmitting 15 kHz stereo audio on a single dial-up Integrated System Data Network (ISDN) phone line.

On one ISDN line, Zephyr provides three data streams: 15 kHz stereo program audio plus ancillary data transmission is carried on the ISDN line's two 64 kilobits per second (kbps) channels, while a 7.5 kHz backhaul channel is sent on the line's 16kbps

channel. The ISDN line consists of a single pair of copper wires.

To compress the program audio signal for transmission, Zephyr uses ISO/MPEG Layer-III technology licensed from Fraunhofer-Gesellschaft IIS of Erlangen, Germany. ISO/MPEG Layer-III is a world standard compression algorithm designed to compress digital audio data to 64kbps per channel or less.

For information contact Nancy Gadish at 216-241-7255; or circle **Reader Service 205**.

Circuit Research Labs Targets RBDS/RDS

LAS VEGAS Circuit Research Labs introduced the SC-100 Radio Broadcast Data System. The SC-100 generates RDS signals and SCA signals (optionally) through 100 percent Digital Signal Processing (DSP) subcarrier generation. The SC-100 is ideal for stations that don't or can't dedicate a PC to the task because static data can be entered from the unit's front panel keyboard and user-friendly keyboard. The unit is equipped with a large fluorescent back-lit LCD screen that is easy to read and to program.

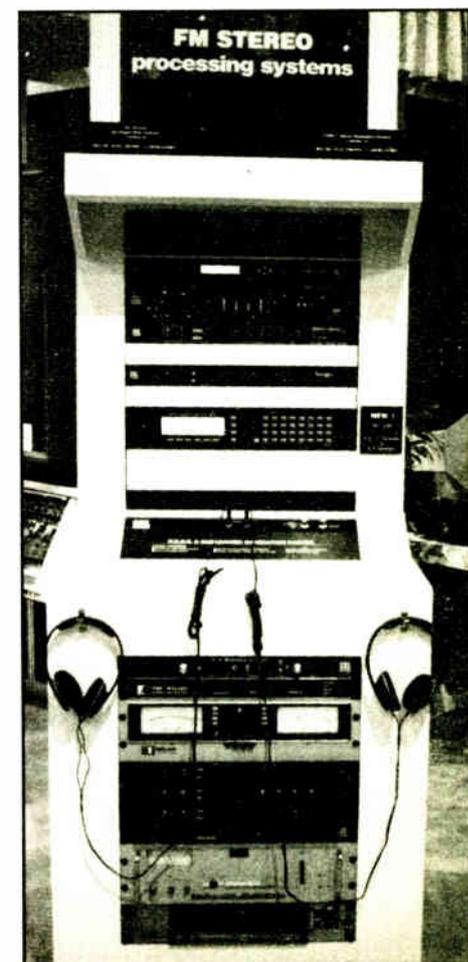
If a station does have a PC or wishes to access the unit from a computer, the SC-100 is equipped with a remote terminal RS232/modem interface for easy dynamic data input from any PC or laptop.

The SC-100 fully supports RDS standard specifications. Your static data is stored within the unit in a non-volatile

memory. An internal real-time clock is included for accuracy.

SCA signal subcarrier generation, provided with two expansion slots, is an available option.

For information contact Bill Ammons at 800-535-7648; or circle **Reader Service 31**.



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| C. Educational FM station | I. Mfg. distributor or dealer |
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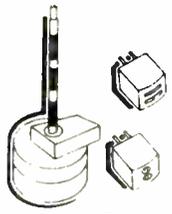
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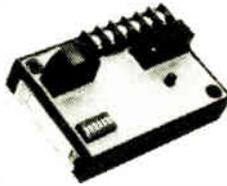
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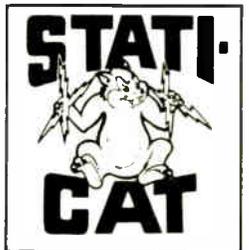


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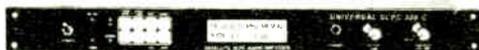
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READER SERVICE NO. 49

OFFBEAT RADIO

Long Island Station Survives Big Fire

by Dee McVicker

HUNTINGTON, N.Y. At about 2 a.m. last Oct. 17, Greater Media Vice President of Engineering Milford Smith was startled awake by the telephone.

A little past midnight the door to the transmitter site at WGSM(AM) Huntington, an upscale residential community on Long Island, was jimmed open. Arsonists had proceeded to torch everything in site.

All was gone within minutes. The 25 kW signal was silenced.

WGSM Chief Engineer Jim Beery, in Florida to attend his daughter's wedding,

called Smith with the news. Beery felt helpless so far from his Long Island post. He called on Smith and anyone else he thought might help. "I woke up *everybody* in the middle of the night," he said.

His call to Smith started an 18-hour marathon search for aid. Telephones jangled across the country for three broadcast engineers, two transmitter manufacturers and even an airplane pilot.

Banding together

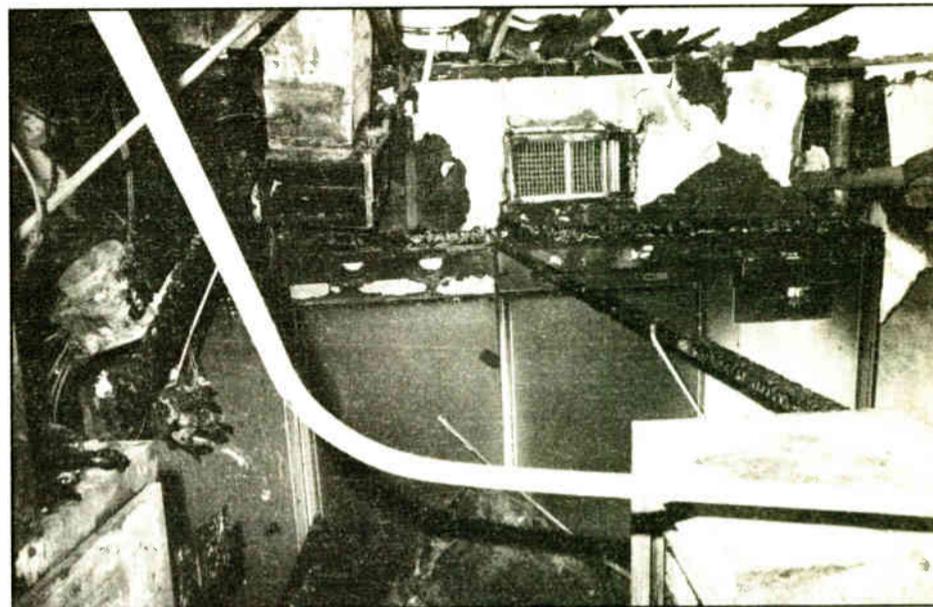
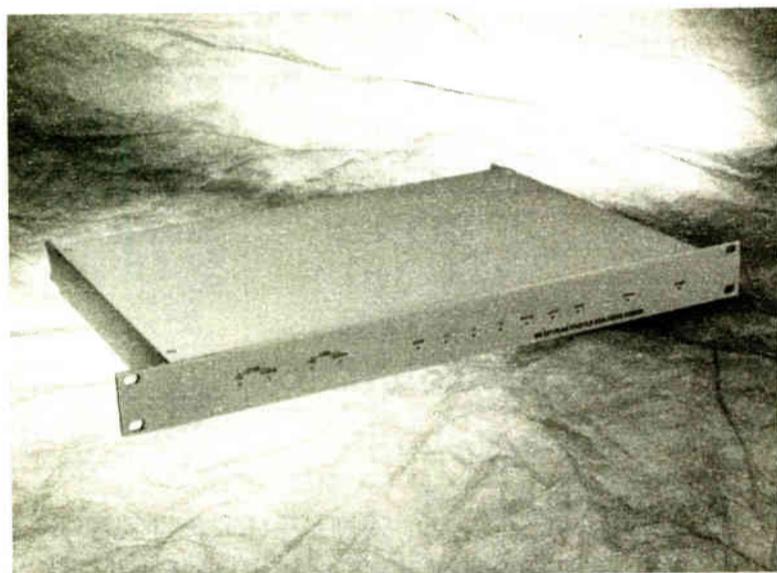
The first call went to Long Island engineer Chris Tobin of WGBB(AM)-WBAB-FM Freeport/Babylon, N.Y.

Tobin agreed without hesitation to accompany WGSM General Manager Paul Fleishman to the charred site. John Caracciolo, engineer for WDRE-FM Garden City, N.Y., also quickly responded to Beery's call and joined the crew.

Meanwhile, Smith, from his home 120 miles away from the now smoldering

said Smith. "They were kind enough to send somebody down to the plant and pull what we needed. At the same time, I called our company pilot and advised him of the situation and he got right down to the airport and headed the plane out to Bangor [Nautel's Maine plant]."

By early afternoon, Stanley and Smith had driven from New Brunswick to Long Island to Republic Airport where they picked up the part. They hurried to the site and faced the ruins for the first time. It was "an incredible mess," Smith said.



Arson was suspected in a transmitter fire at WGSM.

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World Radio History

ruins, called on John Stanley, chief engineer for Greater Media's WCTC(AM)-WMGQ(FM) New Brunswick, N.J., to get a backup transmitter. A 400-watt Nautel served as a second auxiliary at WCTC as well as an emergency backup for any AM station in the chain. It had been ordered with all the components necessary to broadcast on those frequencies.

Stanley also was roused out of bed to meet Smith at WCTC studios to re-tune the Nautel. In the early morning aftermath of the fire, however, Smith and Stanley discovered a critical component missing that was needed to bring the transmitter up to WGSM's 740 kHz.

That meant more calls. "I called Nautel."

But there was little time to take it all in.

Digging out

By late afternoon, power and telephone lines had been excavated at ground level and the telco lines were spliced for use by the engineers. A construction trailer was moved in to house the temporary transmission equipment.

The four-tower directional system was checked for damage and fortunately, said Smith, "the phasor for that system is located in a building at one of the towers. It's the only station in the company that has that setup and it paid off because the phasor was unscathed."

continued on page 38 ▶



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Q-TIPS

Make Yourself a Recruitment Prospect

by John "Q" Shepler

ROCKFORD, Ill. I've received a lot of inquiries about job-hunting strategies, especially related to recruiters. Who are these recruiters? Where do you find them? How do you get them interested?

It used to be that you didn't find recruiters, they found you. Executive recruitment was limited to the top echelons of management. Very visible presidents and vice presidents were courted in secret by their company's competition through these intermediaries known as executive recruiters or search consultants. The rest of us were on our own in locating potential employers.

That has all changed. Just about anyone on salary above the clerical level—especially with a degree—is a potential recruitment candidate, including engineers, talent, salespeople, and, of course, management. If the recruiters haven't found you yet, perhaps you should go looking for them.

Getting started

Where do you find recruiters? Start with your phone book. Look in the yellow pages under "Personnel Consultants," "Employment Agencies" and "Executive Search Consultants." Some firms are franchised, with dozens of offices around the country. Management Recruiters and Dunhill Personnel are two of the largest. They can send your resume anywhere in the country. Many of the smaller firms join affiliate networks, giving them a similar ability to find jobs and candidates outside their local area.

There are two major categories of recruiters, retained and contingency. Retained firms deal primarily with high-level, high-paying jobs, such as company presidents. They are paid on retainer to conduct an in-depth search for the

perfect candidate and collect their fee whether or not someone is actually hired.

Retained recruiters tend to be the ones that search you out. They follow the industry and use extensive personal contacts and industry news reports to find their candidates. My experience has been that these folks are narrowly focused on the search at hand and are not interested in dealing with you unless you are a perfect match to their client. If you are a match though, you'll get the red carpet treatment.

Contingency recruiters, such as Management Recruiters and Dunhill, get paid a fee by the employer only if they place a candidate. Otherwise, they get nothing. People who work in these offices tend to have several searches going on simultaneously. They are most likely to have professional and lower-level management positions.

Over the years, I've sent out hundreds of resumes to both retained and contingency recruiters. The retained people rarely call back, but when they do it is always with something intriguing. The contingency recruiters often call back and are very eager to work with you. But many of the jobs aren't ones you really want. I'd suggest hedging your bets by contacting any legitimate recruiter you can find.

But first a warning: Watch out for anyone who wants your money to help you find a job. The recruiters I'm recommending are not career counselors. They are all paid a fee by the employer, often equal to a quarter to a third of your starting salary. You pay nothing. If in doubt about how someone is getting paid, ask.

Where to look

Now here's where to recruit a recruiter. The most comprehensive source I found is a book called "The Directory of

Executive Recruiters," published by Kennedy Publications, Fitzwilliam, N.H. (605-585-6544 or 800-531-0007). For \$40 you get 5,000 names at 4,000 retained and contingency recruiting offices—less than a penny a head.

The directory is indexed by locality and industry. In my 1991 copy, there are 10 retained and 13 contingency firms listed specifically in the radio and television broadcasting category. The opportunities really expand if you're open to other industries.

A number of other directories with specialized listings for radio and television broadcasting are published yearly with listings for employment search services. They are expensive, but you can probably find them at your station or even the public library.

Now that you have their names, here's how to make contact with recruiters. Type up a one- or two-page resume listing your experience, and most recent job first, plus educational background, awards, licenses, etc. Send this with a cover letter describing what you are looking for, where you'll consider relocating and how much you make. That's all there is to it.

I've never tried a phone campaign, but the local recruitment offices might be receptive to a friendly call.

You probably will not be swamped

with offers in this economic environment. Consider working with recruiters a long-term deal. They seem to come through at odd times and when you least expect it. You want to have your resume in as many files as possible to increase the chances of a match during a given month.

One more little word of caution. If you need discretion in your search, better ask for it and use some yourself. Most recruiters are sensitive to the plight of the employed-but-nervous candidate and will try not to jeopardize your existing job. Even so, lots of hushed phone calls and secret closed-door activities are bound to arouse suspicion. Use some common sense whenever you talk to anyone about job options, lest the word spread quickly around the office.

There you have it, the big secret about how to get recruited for a new job. I wish you the best of luck and would be most interested in hearing how you do. Write me at the address below.

Also, if you're an executive recruiter, I'm always interested in a friendly chat myself.

□ □ □

John Shepler is an engineering manager, writer, and longtime RW columnist. He can be reached at 5653 Weymouth Drive, Rockford, Ill. 61114 or on Prodigy E-mail as GJMS86A.



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ECLECTIC ENGINEER

Credit Woes Can Strike the Unwary

by Barry Mishkind

TUCSON, Ariz. With debt-service bombs from the '80s going off and accelerating trends toward LMAs and contract engineering, credit hassles can create problems for the unwary. Engineers particularly need to understand the problems.

The engineer was once concerned only with making repairs and keeping the station on the air. Now, he often must anticipate financial bottlenecks ahead of time as well as technical needs. Sometimes it's a real trick to get the repairs done, get paid and get the supplier paid.

Over the years, I've had several suppliers call me and ask about long overdue bills. As a common courtesy, I've always gone to the bookkeeper and tried to get things moving. You can probably already guess the wide range of responses. Sometimes bookkeepers have university-level training in stiff-arming payment requests.

The engineer and manager must come to some basic understandings. When taking a contract for servicing a station, I require the station to maintain an open account at a local parts house. I also have a heart to heart discussion about potential credit bombs.

Look around

Most equipment will need maintenance at some point. A good way to ensure timely delivery of replacement parts is to make a checklist of the inventory. Then go to the station's bookkeeper and ask whether any manufacturer is owed a balance.

If so, find out if there was a problem with the supplier. There are a few whose honesty leaves something to be desired. Late or incomplete delivery or defective items are valid reasons for withholding payment. Still, since you'll have to repair it someday, it's to your benefit to try to get matters resolved now. Otherwise, be prepared

for a refusal to ship what you need.

On the other hand, if the station just didn't pay because the general manager didn't get around to it or decided it wasn't a high priority, you could have big problems. It means the GM doesn't understand the narrow range of suppliers you have for some pieces of equipment. It could also mean you'll have problems at some point in getting paid yourself.

A major manufacturer of STLs once told me how to deal with being regularly stiffed by stations.

Some would call in a panic for equipment to get a critical link up. Others would off the air and needed a loaner while awaiting repairs. The manufacturer had an

survey the inventory and anticipate potential problems.

Develop rapport

Equally important for the working engineer is developing good relations with as many manufacturers as possible. It can head off many problems, or at least make them manageable.

It saved a lot of time early one morning when a station's -15 kV bias transformer bit the dust. The parts man said the station had a bad debt on the books, but agreed to ship the part COD, in part because of his working relationship with the station's engineer.

Why was shipping COD a kindness?

A good way to ensure timely delivery of replacement parts is to make a checklist of the inventory.

established policy of helping whenever possible by sending gear out by air, prepaid. Yet, once the emergency was over, payment never quite seemed to happen.

How could the company afford to maintain their great reputation for helping stations with emergencies? They focused on the stations' need for eventual routine maintenance. Once stung, the company would not return repaired equipment until the station prepaid.

"Eventually, they have to come back to us if they want the unit repaired," the manufacturer said.

Unfortunately, this policy was more easily applied in the years before the three-year rule was killed and station trading became so common that a station might have several owners in a very short time. A debt from company "A" might end up stinging company "C" a couple of years down the road.

All in all, this reinforces the need to

Some stations will actually play games like ordering from two suppliers and paying only for the first shipment. The other manufacturer may get the part back, but will still get stuck for the shipping and packaging.

That leads to another annoying trap to avoid. Most engineers I've met are positive, helpful people, ready to extend themselves to get things fixed. Some stations will hire such an engineer to use his good name with suppliers and then stiff them both.

One such station used a relationship developed at an NAB convention to get a complete rebuild of their cartridge recorder for about a fifth of the normal cost. Then they complained about the modest bill and refused payment until the need for replacement parts arose.

Station managers should be on the lookout for engineers who order things and don't follow through by verifying receipt or even turning in the bills. It takes a team effort to keep the suppliers happy and ready to help when you need it.

Book shelf

Here are a couple of recent books worth a look: Bruce and Jenny Bartlett's "Practical Recording Techniques" (Sams, 1992) is an interesting sourcebook for improving the station audio quality. Topics include microphone selection and placement, studio acoustics, monitoring and troubleshooting. There's even a MIDI and DAW (Digital Audio Workstation) primer section for those new to this technology.

TAB Books has released John Lenk's "Audio Handbook" in paperback. This compilation of information and servicing instructions helps you deal with consumer audio products found at many stations. It includes complete descriptions, circuit diagrams and troubleshooting and adjustment procedures for everything from CD, DAT and cassette machines to AM/FM tuners.

□ □ □

Barry Mishkind, aka RW's "Eclectic Engineer," hides out in Tucson, AZ. He can be reached at 2033 S. Augusta Place (85710). Electronic addresses: BMISHKIND on MCI Mail, or "barry@coyote.datalog.com" on Internet (also via CompuServe).



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World Radio History

INSIGHT ON RULES

Station Self Inspection: You Should Have Noticed

by Harold Hallikainen

SAN LUIS OBISPO, Calif. I was recently asked to inspect a station so that they could improve their FCC rule compliance. There were a number of violations that should have been caught by the station's chief operator.

The chief operator's job, I believe, is much more than just keeping the station on the air with good sound. The chief operator should inspect and adjust the station equipment and records to insure compliance. The station should hire someone with a good knowledge of FCC rules and allocate sufficient time for the chief operator to complete those duties.

I used the FCC's self-inspection reports as a guide at this recent inspection. Here's some of what I found after a few hours.

Licenses

No station authorizations were posted or readily available, making it difficult to determine whether the station was operating as authorized. Rule 73.1230(a) requires all station authorizations to be posted at the principal transmitter control point.

A photocopy of an operator restricted permit was posted. Photocopies are allowed if the original permit is posted at another station where the operator is employed. In this case, the operator in question was not employed at another station and the operator on duty at the time was not licensed.

Various operators had signed logs in the past month but did not have permits posted. One operator posted the application form for the permit. Apparently several operators' applications had not been mailed, I was told, because operators were waiting for the station to pay the \$35 application fee. Meanwhile, they operated the transmitter without a license.

No chief operator or acting chief operator designations were posted, as required by Rule 73.1870(b)(3).

Operator Training

Rule 73.1860(c) requires the station to ensure that each transmitter operator is fully instructed and capable of performing all necessary transmission-system observations and adjustments. The operator I spoke with couldn't determine whether the AM or FM transmitters were operating within authorized power limits.

A review of the logs revealed operators that did not have a clear understanding of what they were logging. Parameters on a 5 kW transmitter, for example, were 0.560 kV plate voltage and 1.15 mA plate current. No limit charts for the AM and FM transmitter were posted and no limit charts for the directional antenna were posted.

No notation of any logging discrepancy or notation of a weekly chief operator log review were in the station logs. These log reviews and log entries are required by Rule 73.1870(c)(3).

Tower lights and EBS

A single remote control meter position indicated the current driving all the tower lights on all the AM towers. No limit chart was posted that could be used by operators to determine the failure of a lamp.

Rule 17.47(a)(1) requires the licensee to inspect the tower lights visually every 24 hours or to observe an indicator designed to register the failure of any lamp. I saw no log entry of the required quarterly inspection of tower light control devices and indicators.

All of the lights on one tower were out. I did not see a station log entry noting the lamp failure or of any FAA notification.

The FM at this station operates 24 hours while the AM does not, but the EBS receiver was in the AM control room. An FM operator would not be instantaneously alerted of an EBS alarm, as required by Rule 73.932(a). This could be easily fixed by adding an extension speaker to the EBS receiver.

The EBS receiver was out of service and had been properly logged out of service. But after four months, it still had not been repaired and no record an informal request to the FCC for an extension of time was available. An informal request is required if it takes longer than 60 days to repair the equipment.

For at least a one-month period, neither the AM or FM station log showed reception or transmission of the required weekly EBS test. Since the receiver was defective, I'd expect a weekly notation by the chief operator as to why the tests were not received.

Occupied bandwidth

The AM modulation carrier level control could not be adjusted to 100 percent. This may have been the cause for the near continuous flashing of the -100 percent peak flasher. Stations are not required to have modulation monitors, but are required to avoid overmodulation.

The station had NRSC filtering in the AM audio processor, so the requirement to conduct equipment-performance measurements has been delayed until June 30, 1994, by Rule 73.44(e). Since the NRSC rule went into effect in June 1990, any requirement measurements from prior to that date do not have to be retained.

A copy of the most recent antenna resistance (nondirectional antenna) and common-point resistance (directional) measurements were not available, as required by Rule 73.1225(d)(1).

The remote control would not indicate the nondirectional antenna current. The antenna monitor would not indicate any sample current on the reference tower. Typical log entries of common point current yielded an operating power of 106 percent of licensed. Rule 73.1560(a), requires power to be within 90 to 105 percent licensed.

A check of the directional base current showed the ratio to be 14.4 percent low. Rule 73.62(a) requires base current ratios to be maintained within ± 5 percent.

One of the base tower ammeters was 12 amps full scale while the indication was 3.3 amps, placing full scale at 3.6 times the indication. Rule 73.1215(b)(2) requires normal indication. Since the base current ratio was quite low, it is possible that the meter would meet this requirement should the directional array be operating properly.

continued on page 38 ►



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WORKBENCH

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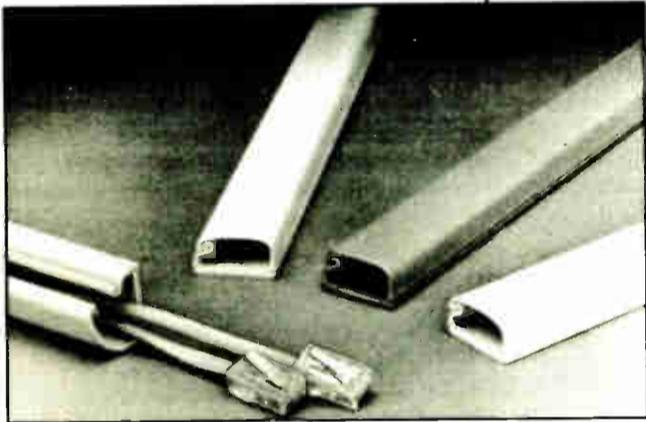
by John Bisset

FALLS CHURCH, Va. In addition to the flowers that the first of May brought with it, yet another regulatory requirement has been imposed on companies with 20 or more employees. Effective May 1, the FCC requires that all telephones on their workplace premises are hearing aid compatible.

This is no left-over April Fool's joke folks—it's serious, and the new law provides for violations to be punishable by fines up to \$10,000 per day, or a maximum of \$75,000 per violation. If your station has less than 20 employees, don't breathe a sigh of relief yet, all telephones must be hearing aid compatible by May 1, 1994.

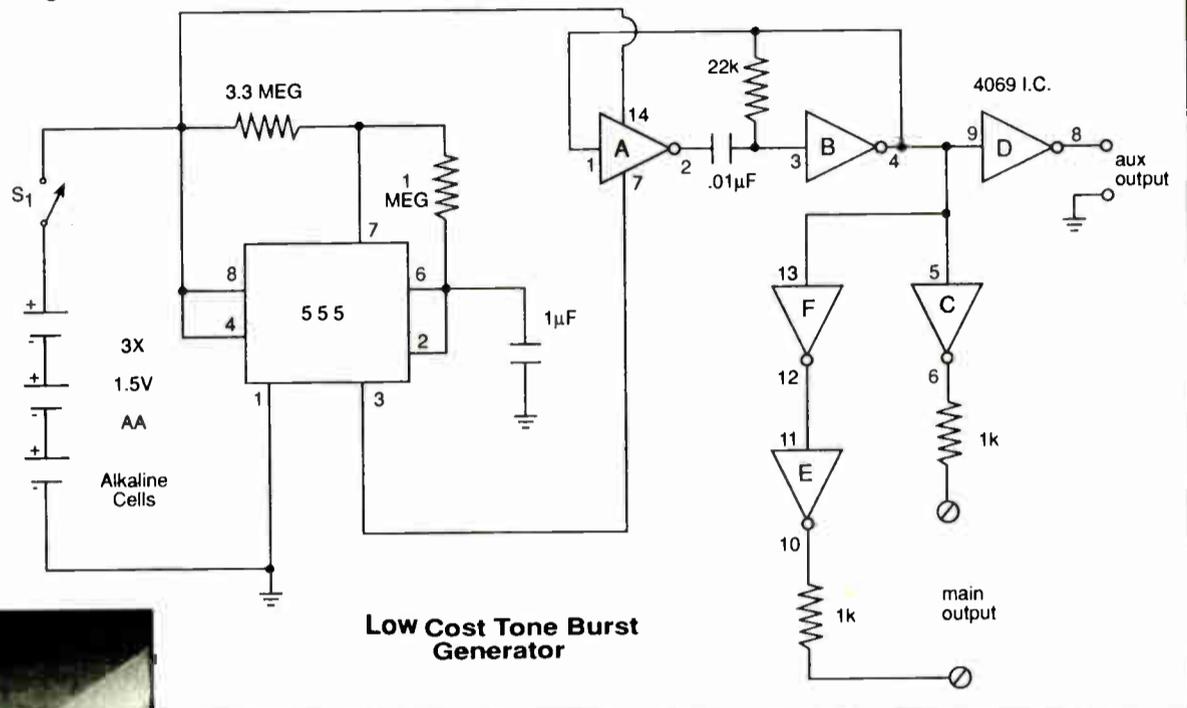
★ ★ ★

Readers who own Pacific Recorders consoles will certainly identify with the



A simple to construct and inexpensive tone burst generator improves radio loop reliability.

Figure 1.



Low Cost Tone Burst Generator

battery common.

The oscillator is keyed by sourcing the ground pin of the 4069 IC through the output pin of the 555 timer. The timer output stays low for approximately one second. During this time period, the oscillator and inverters provide the output drive to the

load.

As the battery voltage lowers during normal operation, the oscillator frequency will decrease. The burst period will remain nearly the same, until the battery voltage drops to 3VDC. At this point, the oscillations will cease.

The battery drain at 4.5VDC is 2mA. When the oscillator is keyed, the current rises to 5mA.

In many broadcast remote environments, vandalism or theft is a nineties

Panduit Corporation is adding some color to their wiremold raceway products. Figure 2 shows four types of adhesive-backed raceway. A free catalog can be obtained by calling 1-800-777-3300; or circle **Reader Service 142**.

□ □ □

John Bisset is a principal with Multiphase Consulting, a contract engineering and projects company. He can be reached at 703-379-1665. Fax tips or ideas to 703-998-2966.

name Bob Moore. Bob headed up PR&E's customer service department for many years.

Bob left PR&E to get back into the feet-to-the-fire world of chief engineering, and is now working at an AM/FM combo in Los Angeles. Since his stations were late in applying for RPU frequencies, they have to depend on telco loops for outside broadcast activity.

Bob came up with a simple tone generator that can be used with temporary loops to alert installers that the pair is in use. A tone on the line improves confidence that the pair hasn't been yanked for another purpose. Bob's design criteria included keeping the cost low, a self-confined power source capable of operating 14 days on a set of batteries, and the ability to drive a 600 ohm reactive load at 0.7VRMS.

The circuit shown in Figure 1 meets the requirements. It is easily constructed on perf board. The generator can be housed in a plastic mini-box or other low cost enclosure. The three alkaline AA cells can be series connected by soldering directly to the battery terminals. The on/off switch is optional.

The circuit consists of an astable oscillator that operates at approximately 2 kHz. The oscillator requires two of the six available CMOS inverters of the 4069 IC. Three additional inverters provide in-phase and inverted output for driving the load. The last inverter may drive an unbalanced load, referenced to

What does Dolby know about RF?

The Making of a Magnetic Flux Man

by George Riggins

LONG BEACH, Calif. What is the standard definition of gauss and weber?

According to the "IEEE Standard Dictionary of Electrical and Electronics Terms" (copyright 1972), the law of Gauss (electrostatics) "states that the integral over any closed surface of the normal component of the electric flux density is equal in a rationalized system to the electric charge Q_0 within the surface.

Closed surface Volume enclosed
 $(D \cdot n)dA = p_0 V = Q_0$

Here, D is the electric flux density, n is a unit normal to the surface, dA the element of area, p_0 is the space charge density in the volume V enclosed by the surface."

Gaussian system (units) is described as "a system in which centimeter-gram-second electrostatic units are used for electric quantities and centimeter-gram-second electromagnetic units are used for magnetic quantities.

Note: When this system is used, the factor c (the speed of light) must be inserted at appropriate places in the electromagnetic equations."

Gaussmeter: A magnetometer provided with a scale graduated in gauss or kilogauss.

Magnetometer: An instrument for measuring the intensity or direction (or both) of a magnetic field or of a component of a magnetic field in a particular direction.

Note: The term is more usually applied to instruments that measure the intensity of a component of a magnetic field, such as horizontal-intensity magnetometers, vertical-intensity magnetometers and total-intensity magnetometers.

From here, the "IEEE Standard Dictionary" lists several subheadings that

have also to do with flux density or the measurement of flux density.

Before describing the weber, here's a little background on Wilhelm Eduard Weber (Oct. 24, 1804-June 23, 1891). The German physicist was one of twelve children in the family of Michael Weber, professor of theology at the University of Wittenberg. E.F. Chladni, an acoustician who lived in the Weber family household is said to have been an influence on Wilhelm.

Weber was important in the develop-



ment of the absolute system of electrical units. He even anticipated some of Maxwell's ideas. The practical unit of magnetic flux is called the weber.

In 1922, Weber entered the University of Halle where he began his first scientific work in collaboration with Ernst Heinrich. Their publication, "Wellenlehre, and Experimente gegründet (1825)," details experimental investigations of water and sound waves. The paper brought Weber to the attention of scientific circles of the day.

Weber wrote his doctoral dissertation under the supervision of J.S.C. Schweigger on the theory of reed organ pipes in 1826. His paper "Habilitationsschrift" (1827) treated such systems as coupled oscillators. He had four papers in Poggendorff's "Annalen der Physik and Chemie" (1828 and 1829). Weber became a lecturer and then an assistant professor at Halle in 1828.

In September of 1828 he travelled to Berlin with Heinrich to deliver a paper on organ pipes at the seventh meeting

organized by Alexander von Humboldt. This paper caught the attention of both Humboldt and Johann Friederich Carl Gauss (see "Old Timer," March 10).

Gauss, at Humboldt's urging, was just beginning work on geomagnetism. He found an enthusiastic co-worker in Weber. A very fruitful six-year association of Gauss and Weber was formed lasting until Weber accepted a professorship in physics at Gottingen in 1831, following the death of Tobias Mayer Jr.

Near the end of 1823, Gauss presented a paper, written with the collaboration of Weber, "Intensitas vis magneticae terrestri ad mensuram absolutam revocata." The paper introduced absolute units of measurement into magnetism. Strength of magnetic property was reduced to measurements of length, time, and mass that could be reproduced anywhere without precalibrated magnetic instruments.

Later, Weber extended the same ideas to other electrical measurements.

Gauss and Weber soon set up a network of magnetic observatories to study and correlate the measurements that were to be made. In 1833 they set up a battery operated telegraph between the physics and astronomical laboratories, a distance of some 9,000 feet. This is believed to be the first practical long distance galvanic telegraph system. The system was most useful for taking accurate simultaneous observations from the two places.

More next time on the collaborative work of Gauss and Weber.

□ □ □

George Riggins has experience in radio and electronics dating back to the 1930s. He is also a licensed ham operator and has had his own broadcast sales and service company, Riggins Electronic Sales, for over 20 years. He can be reached at 213-598-7007.

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FEEDLINE

Where You Stand with RF Rules

by W.C. Alexander

DALLAS The FCC recently proposed to change its rules to conform with the new American National Standards Institute (ANSI) standard for human exposure to radio frequency radiation. We have been hearing about this new standard for some time, but just what is it and how does it affect the broadcaster?

First a little background. The Institute of Electrical and Electronic Engineers (IEEE) updated and changed its "Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1-1991). Last year, ANSI adopted the IEEE standard and renamed it ANSI/IEEE C95.1-1992, replacing the previous ANSI C95.1-1982, the one the FCC makes us all conform to right now.

The new standard differentiates between "controlled" and "uncontrolled" environments. A controlled environment is defined as a location "where there is exposure that may be incurred by persons who are aware of the potential for exposure as a concomitant of employment." An uncontrolled environment is where individuals "have no knowledge or control of their exposure."

This is pretty self-explanatory; a controlled environment would be where occupational exposure occurs, while an uncontrolled environment usually affects the general public.

New terms

There is a change in terminology in the new standard. The term "Maximum Permissible Exposure (MPE)" replaces the old "Radio Frequency Protection Guide" (RFPG). There is very little change in the allowable values of electromagnetic (H) fields for the controlled environment, but the MPE is about five times more restrictive for the uncon-

trolled environment.

The new standard uses RF power density in mW/cm^2 above 100 MHz without making any distinction between E- and H-field components of that field, but below 100 MHz, volts per meter (V/m) for the E-field and amperes per meter (A/m) for the magnetic field is used.

I'm sure 100 MHz was a very convenient place to draw the line, but it splits the FM band in half and separates the low VHF-TV channels from the rest of the VHF-TV band. We can only hope and file comments suggesting that the FCC move this dividing line to some frequency more amenable to broadcasters.

(Comments on the FCC rulemaking are due Aug. 13, 1993. Replies are due Sept. 13.)

Station parameters

For AM stations, the old ANSI standard provided for an allowable RF power density of $1,000 mW/cm^2$ for either the E- or H-field. The new standard for a controlled environment still allows for the equivalent of $100 mW/cm^2$ for the E-field, but the H-field limit has been relaxed to the equivalent of $10^6 mW/cm^2$ or field equivalent.

For an uncontrolled environment, the new standard is more restrictive only above 1340 kHz, where the allowable E-field decreases as the frequency increases. Below 1340 kHz, the standard for both controlled and uncontrolled environments is the same. We wind up with the E-field being restricted to the equivalent of $70 mW/cm^2$ at 1600 kHz.

At that same frequency, the H-field can be as high as $3,900 mW/cm^2$. The allowable time exposure remains six minutes below 1340 kHz, while it increases to 8.5 minutes at 1600 kHz.

Depending on the situation and what, if any, changes the FCC makes when adopting the standard, some stations

may have to move their tower base fences to keep the uncontrolled environment out of higher fields. This is where fencing to "worst case" values will have paid off; there will be a sizable "pad" area inside the base fence which insulates the uncontrolled area from excessive fields.

For both FM radio and VHF-TV above 100 MHz, the new standard for the controlled environment is the same as the old standard ($1 mW/cm^2$) for both E- and H-fields. E-fields below 100 MHz also remain at $1 mW/cm^2$, but the H-field limit is relaxed a bit. This works out to $1.3 mW/cm^2$ at the bottom of the FM band, and about $4 mW/cm^2$ at 50 MHz. Between 300 and 1500 MHz the controlled environment limit remains at $f/300 mW/cm^2$.

For the uncontrolled environment, the MPE between 30 and 1500 MHz is about one-fifth of the levels permitted for the controlled environment. This makes the

standard five times more restrictive in areas where the public has access.

Transmitting sites

We would all do well to remember that the FCC approves a transmitting site (and not an individual licensee) for compliance with the environmental rules. If the site is not in compliance, no one can use it until it is brought into compliance. It makes no difference who is most at fault, so low-power broadcasters take heed—you will be affected just as the megawatt UHF-TV licensees are.

Now is a good time to take a look at your site and see if it will comply with the new standard. You can use the same formulas from the old standard (see OET Bulletin No. 65 or previous installments of *Feed Line*) or you can make actual measurements. It could well be that you will have to provide for larger fenced areas to bring higher RF fields into a "controlled environment," and now is the time to budget for that.

□□□

Cris Alexander is director of engineering for Crawford Broadcasting. He can be reached at Box 561307, Dallas 75356.

Station Survives Inferno

► continued from page 32

With power, studio feed, the station's directional pattern, and the transmitter tuned at last to 740 kHz, the station signed on at 400 watts temporary power less than 18 hours after a nearby resident spotted the first sign of fire.

The next day Smith began to survey the damage. Three transmitters had gone up in flames along with the audio processing equipment, stereo exciter, antenna monitors, modulation monitors, backup generator and an entire spare studio.

Including the building, which was reduced to cinder blocks, total damages tallied close to \$1 million, according to Smith. Almost nothing was salvageable.

Arson probable

County investigators suspected arson. "They determined that there was forced entry to the building via the steel roll-up type garage door. The door was jimmied open. It appears the alarm systems in the building were disabled by the people who broke in," said Smith.

"There is absolute evidence that once they got in there they took some diesel fuel that was in storage in the building for use in a tractor that is used to maintain the property, and poured it all around inside the place, and set it off." No suspects have been apprehended. The station had previously reported other "vandalism and periodic utilization of the site for older youth parties," Smith said.

Meanwhile, efforts to bring the station back up to full power continued. Within two days of the blaze, WGSM had increased its temporary power to 5 kW with a transmitter delivered by Broadcast Electronics. BE had been contacted immediately following the fire, and had the transmitter ready for delivery that afternoon.

The station was now operating at quarter power. "Theory would have it that your coverage is about 40 percent of what it would have been at full power," Smith said. "Interestingly enough, the station ratings were the highest they'd been in years. The core service area was taken care of pretty well."

WGSM returned to full power with a new Nautel 50-kW transmitter operating

at 25 kW. It is being held in the small construction trailer until a construction crew can break ground at a new Long Island transmitter site.

Slowly, said Beery, WGSM is returning to business as usual.

□□□

Dee McVicker has been covering the broadcast beat for four years as a regular contributor to RW and as a freelance writer specializing in the industry. She can be reached at 602-545-7363.

Ensuring Compliance

► continued from page 35

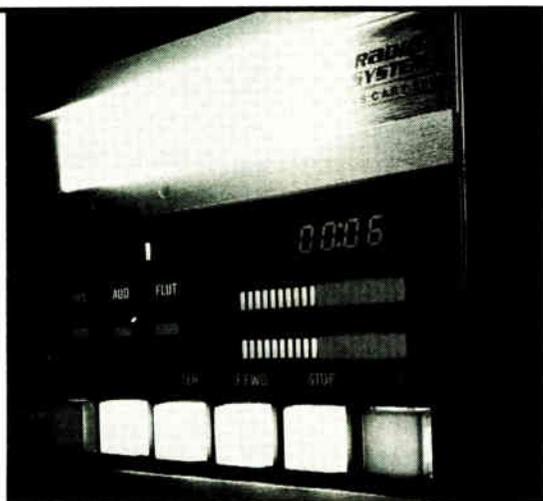
There was no readily available record of when monitor point field strength readings were made, as required by 73.61(a), and no field strength meter was available. I was told that one of the monitor points was "bad" due to construction in the area. No application to change the monitor point had been filed, as required by 73.158(a).

Reminders

In the last article in this series, I reminded you of the July 1, 1993 deadline to have FCC type-notified STL transmitters. The FCC is considering allowing the use of older existing STL transmitters on an emergency basis pending the repair of a notified transmitter. As the rules stand at this writing, however, after July 1 it will not be legal to use a non-notified transmitter at all.

□□□

Harold Hallikainen is president of Hallikainen and Friends, a manufacturer of transmitter control and telemetry systems. He also teaches electronics at Cuesta College, San Luis Obispo, Calif., and is getting better at Contra dancing. He can be reached at 805-541-0200. He can also be reached on internet at ap621@cleveland.freenet.edu.



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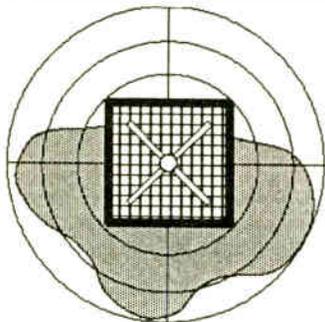
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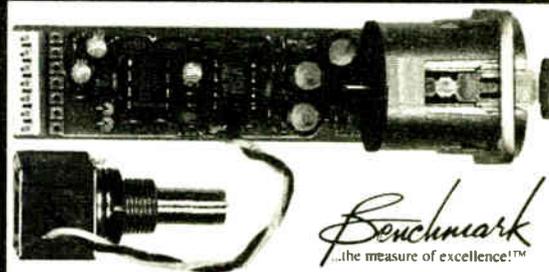
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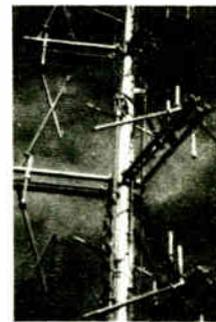
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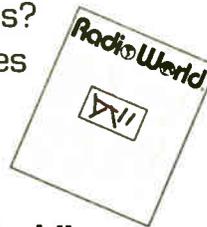
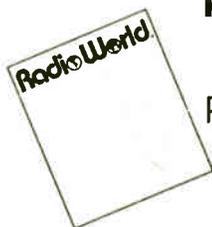
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AB Syst 205A stereo, new, \$400 ea/BO. J Diamond, Blue Diamond, Box 102C Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

McMartin Prog/IFB, BO, several additional items also available. A Croft, Mutual Bdctg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

Video DA, 1 in 3 out, stand alone, 110 VAC oper, BNC conns, \$50. D Burns, Electroman, 5960 Orleans Ave, New Orleans LA 70124. 504-482-3017.

Perma-Power S-102 w/S1420 batt pack, port PA unit, 12 W out, exc cond, \$100. R Sumner, CAVU, 3322 Applegate Ct, Annandale VA 22003. 703-968-8894.

RCA, Altec, Dynaco tube amps, sell of trade. Tracy Eaves, 615-821-6099 (eves before 10PM EST).

RTS 465 mic pre w/limiter, \$150; RTS dual buffer 444 matchbox, \$100; BGW 85 pwr, stereo, 35 w/chan, \$225. J Somich, Somich Engrg, 1208 Stoney Run Trl, Broadview Heights OH 44147. 800-334-3925.

Altec 1568A w/bal inputs, matched pr, \$950/BO; Marantz 8, \$1450; McIntosh MC240, \$1200; MC225, \$750; MC40, \$600; Krell Altair, \$2750; KBL, \$2750; NRG PA1/MC, \$4500/BO/trade. R Katz, Allegro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

McCurdy DA504 (6) dist & pwr sply, 1x12, \$300. B Kuhar, 215-434-7921.

ATI (4) preamps, \$75 ea. N Doshi, WQCD, 220 E 42nd St Ste 2812, NY NY 10017. 212-210-2775.

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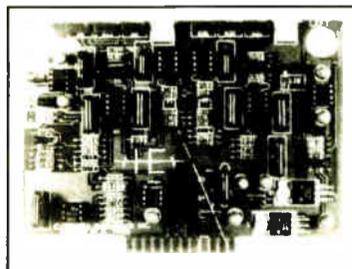
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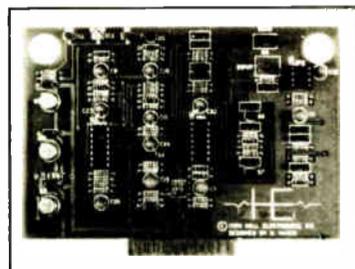
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Tapemaster RP-700 RP, fact refurb, \$150; Tapemaster X-700 RP, \$150. R Chambers, Sierra Bdcg Corp, 3015 Old Johnstonville Rd, Susanville CA 96130. 916-257-2121.

ITC (2), play, mono & (1) ITC R/P, mono, exc cond, \$1000 all. J Hart, Radio Genesis Intl, 13701 W Jewell Ave #1111, Lakewood CO 80228. 303-987-9442.



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ITC Delta I stereo PB, new hds, exc cond, low use. C Guglielmetti, Edgewater Co, 232 C St, San Fran CA 94080. 415-589-3313.

Tapemaster RP-700 R/P, \$200; BE Tri deck, play only, \$950. R Chambers, KSUE, 3015 Johnstonville Rd, Susanville CA 96130. 916-257-2121.

Dynamax CTR 10 R/P, \$1000; CTR 10 play only, \$700, ESD-10 eraser, \$700/BO, all exc cond. B Whittington, KHNS, POB 1109, Haines AK 99827.

BE 5300C tripledeck, stereo, PB, mint less than 50 hrs, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

Want To Buy

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Norton hds (3) full-trk, erase/R/P for Ampex 350, \$150 all/BO; (3) Norton 2-trk stereo tape hds for Scully 280, \$225/BO; Technics hd set for RS-1500 series, 2-trk stereo, erase/R/P, 1/4-trk play hd, unused, \$80; Otari CR-705 rem ctrl for Otari 50950/MTR-10, 5 buttons & LED rec light, 20' cable, \$100/BO; Otari hds for 10" NAB reels, \$25 ea/BO. L Snyder, MBI, Box 182k, Floral Park NY 11001. 718-347-2940.

Otari ARS 1000DC (2), \$450 ea. J Kesler, 606-843-2209.

Scully 280B (4) PB decks, BO. D Brown, 602-645-8181.

Otari ARS 1000 (3), exc cond w/25 Hz tone sensor & cue tone relays, \$375 ea. R Chambers, Sierra Bdcg Corp, 3015 Old Johnstonville Rd, Susanville CA 96130. 916-257-2121.

Ampex 350 w/Scully PB, 7 1/2, 15 & 30 ips w/tenrol, mounted in wood grain console, gd cond, \$400. D Humphreys, Masterwork, 1020 N Delaware Ave, Philadelphia PA 19125. 215-423-1022.

Magnecord 1024 1/4" stereo record PB, exc cond, collectors item, \$75. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Orban studio chassis & STL cards. M Powell, WWPL, 2802 Lomax Ct, Waldorf MD 20602. 301-843-8821.

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Tascam 22-2 2-trk, 2-chnl rec/repro, new, less than 5 hrs, \$500; Fostex 260 multi-trk combo, 6 in 4 out, indep stereo buss, 4-trk, 4-chnl, new, 3 hrs use, \$1100. H Guetzlaff, Trinity Foundation, 5634 Columbia Ave, Dallas TX 75214.

ReVox A77 (2), 1 OK, 1 doesn't record, fair mech cond, BO. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Uher 4200 rep mon, 1/2-trk, port, 3 hds, 4 spds, new, \$500. R Sumner, CAVU, 3322 Applegate Ct, Annandale VA 22003. 703-968-8894.

Magnecord 728; Kenwood KW5066; Sony TC355; Sony 464 CS, all work. G Fitzgerald, G Fitzgerald Music Prods, 37-75 63rd St Ste B29, Woodside NY 11377.

Ampex 600 (3), mono, BO; 1 stereo, BO. Several additional items also available. A Croft, Mutual Bdcg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

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Pioneer RT-707 1/4-trk, gd cond, \$150; (4) Otari ARS1000 PB w/25 Hz detectors, gd cond, \$850; (2) Harris mono, single play, gd cond, \$100; (2) BE 3200 RP, mono, gd cond, \$800; (7) Scully play only, gd cond, \$50; (5) Audi-cord 200, stereo, gd cond, \$100; ReVox A-77 stereo, fair, \$100; (5) Sono-Mag 24-tray Carousel, parts, \$50. O Booth, 601-323-4980.

Aiwa stereo, exc cond, \$75+s/h. R Clark, Northern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

Studer C270 2-track analog mastering, \$2950/BO; Studer HS77 MK IV full-track, mono, 10 hours, \$875/BO/trade; port case for A77 with monitor speakers & power amps, excellent condition, \$375. R Katz, Allegro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

Scully hds, 2-trk, stereo, new, \$225/BO; Ampex hds, full-trk, \$150/BO, both E/R/P. L Snyder, 718-347-2940.

ITC 750 (4) P/B, very gd cond, \$400 ea. R Mason, 703-962-1133.

Roberts 192FT full-trk, tube, gd cond, hums w/Sams Photofact, \$50. S Hoffman, CU Theatre, 2800 W Gore, Lawton OK 73505. 405-581-2428.

3M M-79 24-trk, 2", alternate bias, Selectake II, remote, spares, \$8000/BO. R Friedman, 1137 Rec, 1137 Fillmore St, Baltimore MD 21218. 410-889-4228.

Scully 280 (8) w/roll around cabs, 4 stereo, \$475; 4 mono, \$275, all exc cond. S Horner, KMRO, 2310 Ponderosa, Camarillo CA 93010. 805-654-0577.

Scully 280 parts. R Robinson, TNA Rcdg, 10 George St, Wallingford CT 06492. 203-269-4465.

Audio Technica RMX64 4-trk R/P, 6-chnl mixer/rec, 6 in 4 out, 2 cue sends, panthom pwr, low & hi spd R/P, para EQ, shelving, manuals, \$995. G Fitzgerald, Fitz Music, 37-75 63rd St #B29, Woodside NY 11377. 718-446-3857.

Ampex ATR 700, gd cond, \$500. B Kidd, Airwaves Co, 510 W 2nd, Rayville LA 71269. 318-728-4574.

Otari MX5050 8-trk in custom console, demo, 1/2", \$2000; 8-trk in Rusling console, new, 1/2", \$3000; (3) Technics RSM-65, new, \$250 ea/BO; Sony TC-228 8-trk R/P, new, \$150/BO; Sony TC-777-4 1/4-trk, 1/4", mint cond, \$250. J Diamond, Blue Diamond, Box 102C Chubbic Rd RD 1, Canonsburg PA 15317. 412-746-3455.

Studer A80 8-trk, 1", \$1900. B Kuhar, 215-434-7921.

MCI 110B boards, hds, motors, used, working, 1/2 wholesale price. M Shea, Precision, POB 723, NY NY 10276.

Tascam 32, 2-trk w/rack ears, new in perfect cond, \$980. R Payne 313-786-1767.

MCI JH-110B 2-trk w/o cabs, BO; (10) Ampex 440 xports, BO; (2) Ampex 444 elects, BO; (9) Ampex 440 roll-around; (6) Harris/Gates R/P, BO. Several additional items also available. A Croft, Mutual Bdcg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

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Otari ARS 1000 (4), exc cond w/25 Hz tone sensor & cue tone relays, \$350 ea. R Chambers, KSUE, 3015 Johnstonville Rd, Susanville CA 96130. 916-257-2121.

Otari Mark II-IV 1/2" 4-trk, multi-trk, mint, less than 50 hrs, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

Tascam 58 8-track, 1/2", very good condition, low hours, XLR in/out, connections for SMPTE lockup with video, manual, 10 1/2" take-up, \$2000. T Carroll, In-House Productions, 456 9th St #20, Hoboken NJ 07030.

Scully 280 14" stereo & elects in console. K Kenze, KFEX, 13 E 11th, Washington MO 63090. 314-239-0209.

Tascam 32 2-track & 38 8-track, like new, \$2000/both; Teac 3340 4-track, 1/4" deck, \$375; Tascam 80-8 8-track never really used/perfect, \$1600. W Gunn. 619-320-0728.

Tascam 40-4 w/dbx & flight case, \$950; Tascam 48 8 trk, exc for sync, \$2950. W Gunn. 619-320-0728.

Ampex ATR800 mono, like new, \$1200 & AG440-8 1" 8-trk; Otari 7800 1" 8-trk, \$2900. W Gunn. 619-320-0728.

Scully 270 14" PB, 1 stereo plus 1 mono for parts, \$200/both; Ferrograph Super 7, 10", 3-7-15 ips, 2 trk, \$300. W Gunn. 619-320-0728.

Want To Buy

Otari MK III 8-head bridge with out heads. R Robinson, TNA Recording, 10 George St, Wallingford CT 06492. 203-269-4465.

High spd cass tape duplicator for 3 copies from master. D Vine, WTTM, 762 Mayflower Ave, Lawrenceville NJ 08648. 609-989-4747.

EMPLOYMENT

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CE w/big prod voice & over 15 yrs hands-on engrg exper seeks CE pos w/prod/air shift in top 100 mkt. G Morgan, 704-563-8676.

Exper CE, ISCET, NARTE, NABER-act certifi, amateur radio op, FCC licensed, seeks FT/PT contract work near NYC. M Rakoff, 114-41 Queens Blvd #148, Forest Hills NY 11375. 718-591-3859.

GM for Fla med/large mkt, 29 yrs sales/prog/engrg exper, turn-around/start ups, avail immed. 813-849-3477.

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Exper engr seeks maint pos w/ite air shift, SW mtn area pref, not ltd. Engr, 7894, Palm Grove, Indianapolis IN 46219.

3-time state AP award winner seeks sports/PBP pos, exper newsperson, tape & resume on request. Mark, 503-386-2163.

Seeking job w/talk radio, news/sports talent, promo exper, play-by-play exper. 804-474-2934.

Skilled engr seeks FT/PT/contract maint w/AM/FM, built 1st FM to bcdt from World Trade Ctr, odd hrs OK, own tools & test equip, reasonable rates, gd voice, will travel 100 miles. 718-347-2940.

Exper air personality seeks FT airshift, prog/sports, SE/midwest, pref oldies/classic rock/AOR/C&W/AC formats, great voice & prod. Jack, 414-242-4357.

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Salesman, for very small market radio in SW Arizona, retired or semi retired for Winter Visitor season. Would need to work out of a Motor Home. KBUX, POB 1, Quartzsite AZ 85346.

Engineer wanted for 100K FM located in Greensboro, NC. Equal Opportunity Employer. Send resume to: Brian Beasley, 4002-E Spring Garden Street, Greensboro, NC 27407.

Engineer Wanted for several small market radio stations. Must have good knowledge of AM/FM transmitters, studio equipment both analog and digital, and FCC rules and regulations. \$30,000 per year plus van and equipment. Send resume to Gary Coates, 303 Spring, Fordyce AR 71742.

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Nagra 3S/4S w/NAB hds; Sony TC880/8750; ReVox B215S cass deck. R Katz, Allegro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

Scully '100' recorders, record/play amps, 8, 16, 24 track hds. Sequoia Electronics, 1131 Virginia Ave, Campbell CA 95008. 408-866-8434.

CD's/PLAYERS

Want To Sell

Denon DN-950F (2), \$300 ea. N Doshi, WQCD, 220 E 42nd St Ste 2812, NY NY 10017. 212-210-2775.

TEAC PD 325 plyr & rem, exc cond, \$75+s/h. R Clark, Northern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

Want To Buy

Nikko NCD 600 CD auto change plyr svc manual, and info to connect units to PCs. R Meyers, Benchmark Comms, 4700 SW 75th Ave, Miami FL 33155. 305-264-5963 FAX 303-264-2357.

Denon/other w/varispeed. R Robinson, TNA Rcdg, 10 George St Wallingford CT 06492. 203-269-4465.

COMPUTERS

Want To Sell

NEC 8088 version for XT, plug in rplcmnt, \$15/BO; Intel 8087 w/match co-proc for XT, \$75/BO; Autosketch drafting prog w/manual, \$50/BO. L Snyder, 718-347-2940.

Tandy 2000 w/software, \$375; Kaypro port, \$200; Texas Instr 810 printer, \$450. R Robinson, TNA Rcdg, 10 George St, Wallingford CT 06492. 203-269-4465.

CONSOLES

Want To Sell

Harris Stereo 5, gd cond, \$550 H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

BE 8M250 in excel cond, \$3500/BO; Sparta A16R in exc cond, \$1000/BO. Call Mark at 619-598-3311.

Sparta Centurion 6-pot, pwr sply, mono, gd cond, \$600. M Vanhooser, KSKY, 4144 N Central Exp #266, Dallas TX 75204. 214-827-5759.

Sparta 8-chnl, mono, gd cond, \$500; Sparta 5-chnl, \$250. R Chambers, KSUE, 3015 Johnstonville Rd, Susanville CA 96130. 916-257-2121.

Sparta 8-chnl mono, Audion, mix & prog, gd work cond, \$500; 5-chnl stereo, Audion, aux & prog on all chnls, \$250. R Chambers, Sierra Bdcg Corp, 3015 Old Johnstonville Rd, Susanville CA 96130. 916-257-2121.

Tascam M-30, 8x4 w/subs & EQ & Mdl 34 4-trk, \$750 ea/BO. 619-229-8307.

Altec 1628A 8-chnl auto mic mixer, 2 sp rkmt, very gd cond w/manual, \$275; JBL 5600-2, 3 sp rkmt, gd cond w/manual, \$135. S Hoffman, CU Theatre, 2800 W Gore, Lawton OK 73505. 405-581-2428.

Russco 505 5-chnl rack mount, mono, \$50. C Hicks, WEAX, W Park Ave, Angola IN 46703.

McMartin B502 5-pot stereo, \$350/BO; Gates pwr sply/audio amp, unit only, \$30/BO. D Carver, KZBK, 107 S Main, Brookfield MO 64628. 816-258-7458.

Arrakis 150SCT (2) 6-chnl, mono, rotary pots, exc bds, used 4 mos, \$2800 both. J Hart, Radio Genesis Intl, 13701 W Jewell Ave #111, Lakewood CO 80228. 303-987-9442.

Ampro MT 5 MR 5-chnl, dual out- put, mono, \$500+s/h/BO or trade dist amps. B Burnham, WCAR, 32500 Parklane, Garden City MI 48135. 313-525-1111.

Peavey MK3-16-FC 16-input, phantom pwr, 4-band EQ, stereo mix buss, 2 cue outputs, 2 mon outputs, in-flight case, very gd cond, \$800+s/h/BO. Kerry, Emerald Sound, 1033 16th Ave S, Nashville TN 37212. 615-327-9544.

PR&E C1-2/T1-2/TT-3 interface units; (2) stereo cart w/3 inputs ea; (2) R-R w/1 input ea; turntable w/2 inputs, \$150 ea/\$600 all. C Guglielmetti, Edgewater Co, 232 C St, San Fran CA 94080. 415-589-3313.

Ramko DE 12-SR 12-chnl stereo, gd cond w/manual, \$1200. M Benson, 916-893-8737.

Alesis 1622, exc cond, \$500+s/h. R Clark, Northern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

Ward Beck custom console w/9 inputs, BO; Spotmaster 4-input, BO. Several additional items also avail. A Croft, Mutual Bdcg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

McCurdy 7000/8000 Series parts & manuals. B Kuhar, 215-434-7921. **Gates Yard Board,** painted white, \$300; **Bogen CSM remote mixer,** \$125. W Gunn. 619-320-0728.

Want To Buy

Sparta/Cetec Centurion mods, whole/parts, working, pref rotary pots. M Vanhooser, KSKY, 4144 N Central Exp #266, Dallas TX 75204. 214-827-5759.

Cetec 001-2003 schematic. R Mize, KZML, 3514 Kings Ct Way, Sierra Vista AZ 85635. 602-458-9631.

DISCO & SOUND EQUIPMENT

Want To Sell

Pultec SP-3 stereo panner, tube, very gd cond w/manual, \$250; Ampex ADD-1 stereo DDL, \$500; road case for Sony 3/4" U-Matic, exc cond, \$250; TEAC AN-80 Dolby B noise reduc unit, gd cond, \$100. D Humphreys, Masterwork, 1020 N Delaware Ave, Philadelphia PA 19125. 215-423-1022.

TEAC EQA-30BL 10-band graphic EQ w/real time freq spectrum analyzer & LED display, new, less than 10 hrs, \$175. H Guetzlaff, Trinity Foundation, 5634 Columbia Ave, Dallas TX 75214.

Soundworkshop 262 stereo reverb, new, \$400/BO. ART DR1 dig reverb; ART 01A dig reverb, new, \$500 ea/BO; Loft 450 delay line/flangers, new, \$400 ea/BO; (2) Nexus 96-pt patch bays, new, \$300 ea/BO. J Diamond, Blue Diamond, Box 102C Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Korg DW8000 w/heavy duty case, \$500; Arp Omni 2, \$350; Roland TR707 drum mach, \$250. G Fitzgerald, G Fitzgerald Music Prods, 37-75 63rd St Ste B29, Woodside NY 11377.

Rane MP24 mixer/preamp, nice cond, \$800/BO. Shannon, WRFA, 800 8th Ave SE, Largo FL 34641. 813-581-7800.

Yamaha MDF-1 disk drive for QX5 sequencer, \$100; Yamaha QX5 MIDI sequencer, \$150. P Cibley, Cibley Music, 138 E 38th St, NY NY 10016. 212-986-2219.

dbx 222 noise reduction system, good condition, \$50+s/h. R Clark, Northern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

DOD crossover 2-way stereo, 3-way mono w/1/4" jacks, \$125. J Gardner, 816-644-5547.

BGW Mdl 10, mono, 2-way, elect crossover with frequency select, 1 sp rackmount, good condition with manual, \$75. S Hoffman, CU Theatre, 2800 W Gore, Lawton OK 73505. 405-581-2428.

Yamaha DMP-7 digital mix proces- sor, prog auto line mixing, digital FX, motor faders, 30-scene storage, MIDI, 10 sp rack mount, very good cond, \$975; Garrard MRM 101 phono preamp, good condition, \$65. S Hoffman, CU Theatre, 2800 W Gore, Lawton OK 73505. 405-581-2428.

EV SH 1502-ER 2-way mobile with 15" woofer & titanium driver/ horn in carpeted cab with handles, steel corners & grill, new condition. B Fisher, KPOK, POB 829, Bowman ND 58623. 701-523-3883.

Tad/Pioneer TL-1601A (4) 16" 300 W, low frequency, 8 ohm, good condition, \$125 each/BO; (14) 4" dia beryllium diaphragm for Mdl TD-4001 high freq driver, 16 ohm, good condition, \$125 each/BO. Kerry, Emerald Sound, 1033 16th Ave S, Nashville TN 37212. 615-327-9544.

Dolby 301 A-type stereo, discrete, \$500. W Gunn. 619-320-0728.

Snake, 16 phantom-powered inputs with ext ps; 250' Beiden 19-pair cable, mil conns, ss strain reliefs, 10' Neumann XLR snake mats w/box or Beiden snake, excellent condition, \$750/BO/trade. R Katz, Allegro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

Tannoy PBM 6.5 near field ref mon, excellent condition, \$250+s/h. R Clark, North-ern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

Synthesizers: Korg DW8000 with heavy duty case, \$500; Arp Omni 2, \$450; Roland TR707 drum mach, \$250; Casio CZ101, \$175. G Fitzgerald, Fitz Music, 37-75 63rd St #B29, Woodside NY 11377. 718-446-3857.

Orban 222A stereo spectral enhancer, unused, \$500. C Knerr, KCNA, 139 SE J St, Grants Pass OR 97526.

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Mod Sci CP803 proc, BO; Gentner Audio Prisms, both chnls, BO. J Vavriek, KSYZ, 3532 W Capital, Grand Island NE 68801.

CRL AM-4 mono, exc cond, \$1700/BO. M McNeil, Guardian Comms, 800 Compton Rd #33, Cincinnati OH 45231. 513-931-8080.

OPTIMOD 8000 & 8100 FOR SALE 414-482-2638

UREI LA3A, noisy, 2 sp rkmt w/manual, exc cond, trade for Shure SM99/EP CP218 gooseneck podium. S Hoffman, CU Theatre, 2800 W Gore, Lawton OK 73505. 405-581-2428.

Orban 8100AXT2 6-band comp chassis for Optimod FM. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Hnat Hindes Amaze proc & CO 2013 Compro, exc cond, BO; CBS Volumax 400 AM, new caps, recent proof, exc cond, \$150. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

CRL PMC 450. G Patschke, KIJN, POB 458, Farwell TX 79325. 806-481-3318.

Inovonics MAP-230 multi band proc, fair cond, \$300; Unv Audio BL-40 audio proc, gd cond, \$300; Harris Mono-80, 8-chnl board. O Booth, 601-323-4980.

CRL PMC 300A (2), \$250/BO. C Hicks, WEAX, W Park Ave, Angola IN 46703.

Orban 8100 XT-2 proc w/6-band & studio chassis, mint cond, \$5200; Mod Sci Comp Clipper, \$500. B Watson, KSAK, 3352 Honeybrook Way #7, Ontario CA 91762. 909-947-8440.

RCA BA43/45 (2) ABC/limiter on rk tray, \$200. B Kuhar, 215-434-7921.

CRL SMP 900 AM stereo matrix proc. M Young, WJON, Box 220, St Cloud MN 56302. 612-251-4422.

dbx 160s, \$950 pair. J Wells, SoundArts, 8377 Westview, Houston TX 77055. 713-464-4653.

CBS Volumax 400 (2) auto peak, BO. L Smith, WIOZ, POB 1677, S Pines NC 28388. 919-692-2107.

Gates Solid Statesman (2), exc cond & BL-40 Modulimiter, BO. E DeLa Hunt, KPRM, Hwy 34 E, Park Rapid MN 56470. 218-732-3306.

Orban 8000A exc cond, \$1675/BO. M Friend, WTJU, 711 New-comb Stat, Charlottesville VA 22904.

Want To Buy

Orban 8100A/8200/Unity 2000. Mark, 210-875-2555.

Orban XT2 6-band for 8100/A, gd shape. B Garcia, KBUR, 1411 Roosevelt Ave, Burlington IA 52601, 319-752-2701.

Optimod-9100A, gd cond. H Cambero, 305-380-6001.

MICROPHONES

Want To Sell

Sennheiser 441 (matte), new w/all papers & response curves, \$450. R Payne 313-786-1767.

Beyer M58 dynamic stick, \$125; EV RE-20, \$250; Sennheiser MD-421U, \$200; Sennheiser MD-421U, \$275; EV 635A, \$85; AKG D-1000E, \$40; AKG D12E, \$50; AKG D12, \$40. J Somich, Somich Engrg, 1208 Stony Run Trl, Broadview Heights OH 44147. 800-334-3925.

Shure SM-7 w/metal case, \$295; EV RE-27ND, new, \$400. J James, Marin Voice, Box 1802, Sausalito CA 94966. 415-331-5346.

Deumann D-67, \$2350. J Wells, SoundArts, 8377 Westview, Houston TX 77055. 713-464-4653.

AKG C535, excellent condition, \$175+s/h; AKG stand/boom, \$25+s/h; Symetrix phantom power, excellent condition \$150+s/h. R Clark, Northern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

Sennheiser 405 mkh, cardioid con- denser, capsules cleaned, preamps aligned 10/92, excellent condition, \$500. J Newman, 401-847-0455.

Telefunken/Schoeps CM61 tube, rare, mint cond, \$3475/BO. R Katz, Allegro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

Sennheiser 421U (3), used 4 mos, \$500 all. J Hart, Radio Genesis Intl, 13701 W Jewell Ave #111, Lakewood CO 80228. 303-987-9442.

EV 676 supercardioid mics 3/\$200; EV RE10 mic, \$125. W Gunn, 619-320-0728.

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| Audio Production (Other) | Limiters | Tax Deductible Equip |
| Automation Equip. | Microphones | Test Equipment |
| Brokers | Miscellaneous | Transmitters/Exciters |
| Cameras (Video) | Monitors | Tubes |
| Cart Machines | Movie Production Equip. | Turntables |
| Cassette & R-R Recorders | Receivers & Transceivers | TV Film Equip. |
| CATV-MATV Equip. | Remote & Microwave Equip. | Video Production Equip. |
| CD's | Satellite | Video Tape Recorders |
| CD Players | Software | Positions Wanted |
| Computers | Stations | Help Wanted |

Display Rates for Classified Advertising Effective January 1, 1991

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| Distributor Directory | 90 | 85 | 80 | 75 |
| Professional Card | 60 | 55 | 50 | 45 |
| Classified Line Ad | | \$1.50 per word | | |
| Blind Box Ad | | \$10 additional | | |

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Telefunken M-250, U-67, 221-A; Neumann U-67, KM-56, UM-57; RCA KV3A-10,0001, 44-BX, 77-DX, BK-4, BK-5, 74-B, varicustics; Altec M-20, M-11, M-30 tube type mics. Trade or sale. Tracy Eaves, 615-821-6099 (evenings before 10PM EST).

Telefunken tube mic pre amps V-76, U-73 limiter's; RCA BA-21As, BA-1As; Altec tube mic-pres. Tracy Eaves, 615-821-6099 (evenings before 10PM EST).

Want To Buy

RCA 44BX to rebuild. E Coker, KTRH, POB 1520, Houston TX 77251. 713-630-3530.

RCA 77-DX not working OK, silver/gray. M Miller, WSDM, POB 650, Brazil IN 47834. 812-446-2507.

AKG C24. R Katz, Al'egro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

RCA 77DXs/44BXs ribbon, chrome/TV grey, good condition, BO. R Kaufman, Pams Productios, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

77-DX's, 44-BX's, KU-3A's On-Air lights. Top price paid. Fast response. Bill Bryant Management, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131.

MISCELLANEOUS

Want To Sell

Audiolab TD-3 in exc cond, \$325/BO. Call Mark at 619-598-3311.

Teletype, various, one each mdl 28RO, mdl 28KSR, mdl 19KSR, mdl 32ASR, manuals included, BO. R Meyers, Benchmark Comm, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963 FAX 305-264-2357.

Retron Blowers for Elcom, Harris, CCA, CSI, McMartin, rebuilt & new. Goodrich Enterprises Inc. 11435 Manderson St Omaha, NE 68164 402 493 1886 FAX 402 493 6821

MAD black rack shelf, \$20; 3M 1/2" paper leader, \$5/roll. P Cibley, Cibley Music, 138 E 38th St, NY NY 10016. 212-986-2219.

RCA BA 146 limiter amp manual. J Graham, Graham Bdct Svcs, POB 242, Sandy Springs SC 29677. 803-242-1005.

Radio sales training tapes on 16 VHS tapes, 30 topics, \$2000. R Trumbo, KNLF, POB 117, Quincy CA 95971. 916-283-4145.

ADC Jackbay unwired, 52 1/4" TRS jacks w/normals, \$125; ADC Ultra-patch 4-26290-0010 jackfield punchdown block, \$50 ea/\$125 for 3; Sescom mic splitter, 1 in 2 out x 4, \$75 ea/\$200 for 3; Gentner Microtel, \$100; ESE MS-570 dig timer, \$40. J Somich, Somich Engrg, 1208 Stoney Run Trl, Broadview Heights OH 44147. 800-334-3925.

Studio equip, \$14K. M Lobaito, Teletek, 156 Burbank Ave, Staten Island NY 10306. 718-987-2318.

Mic stand, fair cond, \$20+s/h; 7" reel tap, gd cond, \$25+s/h; cables, exc cond, \$25+s/h. R Clark, Northern Aire Audio, 3 NE 63 Terr, Kansas City MO 64118. 816-454-8067.

Anvil briefcases, new/used, \$50/BO+s/h. L Snyder, 718-347-2940.

Viking DVA 1000 (2) dig phone answer/rcvr, great cond, \$200 ea. L Walker, WIOZ, POB 1677, S Pines NC 28388. 919-692-2107.

CHS-52 (2) intercom headset, carbon mic, coiled cord, new cond, \$20 ea+s/h. G Kirby, Gray Fox Video, 13613 US 36, Marysville OH 43040. 614-261-8871.

78 rpm library w/6000 10" singles, gd cond, various formats, BO. B Kuhar, 215-434-7921.

Square D 60 amp, 3-pole, double throw, enclosed, good condition, \$75/Best Offer; 240/480 V, hi voltage; 120/240, low voltage, indoor, dry, \$50/Best Offer; 120/240 V primary, 16/32 V secondary, 0.750 KVA, NEMA raintight enclosure, \$40/ Best Offer; relay (2) P&B KRP14AG, 3PDT, 10 amp, 120 VAC coil, 11-pin octal style plug in, unused, \$3 each; home brew relay panel, 6 DPDT with onboard power supply, \$25/Best Offer. D Carver, KZBK, 107 S Main, Brookfield MO 64628. 816-258-7458.

Bulk tape eraser, heavy duty, 220 V, BO. Several additional items also available. A Croft, Mutual Bdctg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

Want To Buy

RCA/Collins/Gates literature, 40s/50s. T Knapp, 1937 Valley Dr, Las Vegas NV 89108.

RCA M1-11718-1 lighted studio sign w/on-air glass. M Neff, WARM, Wilkes-Barre Scranton Hwy, Avoca PA 18641. 717-655-2271.

RCA BC7B mods; phone hybrid syst; A/C & gold reels w/25 Hz tones. K Haight, KCMX, 820 Crater Lake Ave #213, Medford OR 97504. 503-482-2614.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NUNY 10003. 212-674-3060.

Radio xfrms by Chicago. UTC, Triad, Peerless, Freed, Sola, send list. J Gangwer, 942 32nd St, Richmond CA 94804. 415-644-2363.

MONITORS

Want To Sell

McMartin EBS/2 & TG2, gd cond, \$600 both. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Belar AMM-2A AM mod mon, gd cond, \$500; RFA-1 AM RF amp, gd cond, \$300; Belar SCA mod mon, gd cond, \$300; Fluke 8840 5 1/2 digits, true RMS meter, gd cond, \$600; Phelps CFM-HP10 10-bay FM, hi pwr on 99.5 MHz, BO; Harris FM-20H 20 kW on 99.5 MHz, gd cond, \$15K; QEI 6 W exciter on 99.5; 400' of Andrews 3 1/2" line, gd cond, BO. O Booth, 601-323-4980.

Professional SCA demod card w/exc crosstalk rejection, \$20. Superadio III w/SCA, \$85. Performance guaranteed. 800-944-0630.

McMartin EBS AM rcvr; 1979 Triad pwr sply; 6' rack, Sorensen volt reg; 1979 LPB lim/comp. J Wilsbach, WMSS, 214 Race St, Middletown PA 17057. 717-948-9136.

QEI 691-02 w/67 & 92 SCA, gd cond w/book, \$3500/BO; HP 335B FM mod, nds work w/book, \$75/BO. D Carver, KZBK, 107 S Main, Brookfield MO 64628. 816-258-7458.

Want To Buy

McMartin (buy & sell) any model. C Goodrich, 11435 Manderson, Omaha NE 68164. 402-493-1886 or fax 402-493-6821.

MOVIE PROD EQUIP

Want To Sell

Technicolor w/zoom lens & mic, 8mm, port, rec, pwr sply, cables & cases, \$200+s/h. G Kirby, Gray Fox Video, 13613 US 36, Marysville OH 43040. 614-261-8871.

PATENTS AVAILABLE

OFDM TECHNOLOGY:

Patents rights for OFDM digital communications technology are available for assignment. Applications include Digital Audio Broadcast (DAB), Mobile Radio Data Terminal (MRDT) and High Speed Date Rate Subscriber Loops (HDSL). Patents No. 5063574 of Nov. 5, 1991, "MULTI-FREQUENCY DIFFERENTIALLY ENCODED DIGITAL COMMUNICATIONS FOR A HIGH DATA RATE TRANSMISSION THROUGH UNEQUALIZED CHANNELS" is the basic patent. Patent No. 5166924 of Nov. 24, 1992, "ECHO CANCELLATION IN MULTI-FREQUENCY DIFFERENTIALLY ENCODED DIGITAL COMMUNICATIONS" is a continuation in-part of the basic patent. For further information: Mercury Digital Communications FAX: (408) 649-5218

RECEIVERS & TRANSCEIVERS

Want To Sell

McMartin (2), gd cond, \$75 ea/BO; (2) Johnson, \$110 ea/BO, both 67 kHz, Xtal, tuned; Sony STJ-75 FM, mon quality, 75/300 ohm input, new, 8 push-button, seek, scan, \$1150/BO. L Snyder, 718-347-2940.

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GE MPI hand-held 2-chnl, 2-way, exc cond, 1st freq, 467.350 MHz. J Newman, 401-847-0455.

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Tel: 813 378 5425 FAX: 3394

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Want To Buy

Sansul QSD-1/4 sound proc. R Longseth, Surround Plus, Box 64, Emery SD 57332. 605-449-4759.

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REMOTE & MICROWAVE EQUIP

Want To Sell

TFT 7601 C/R, gd cond, \$1225; SCA gener, 110 kHz, \$450. B Bales, KNDR, Box 516, Mandan ND 58554. 701-663-2345.

Marti RMC-15 w/manual, \$390. R Chambers, Sierra Bldg Corp, 3015 Old Johnstonville Rd, Susanville CA 96130. 916-257-2121.

COMREX RENTALS

1, 2 and 3-Line Extenders Switched 56 Systems
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Silver Lake Audio
(516) 623-6114 FAX: 377-4423

Gentner SPH-3A telephone interface syst, \$325. R Sumner, CAVU, 3322 Applegate Ct, Annandale VA 22003. 703-968-8894.

Comrex RRB (2) dual-chnl xmtrs & dual-chnl rcvr, BO. M Aldridge, Remote Sound, POB 616, Ooltewah TN 37363.

Burk TC-8 for Telco 2 wire link w/ relay panel. J Webber, 518-382-5400.

RENTALS RENTALS RENTALS

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Audio/Video Consultants

Orban Studio Chassis for Optimod 8100A/1, use before disceet L&R phone lines/STL, used less than 3 mos, orig box, exc cond, \$450. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Rust RC 1000 syst w/manuals, clean mech cond, BO; Moseley TRC 15-AR 15-chnl w/Hallikainen dig add-on, gd cond, \$950/BO; Marti STL-10 on 946.875/947.125 w/ xmtr/rcvr combiners, less than 3 yrs old, exc cond, \$5200; Gentner VRC 2000 & interface panels. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Gentner EFT 3000 pair, 3-line freq ext, very gd cond, \$5000/BO. Randy, WHFS, 8201 Corp Dr #550, Landover MD 20785.

Marti RPT-15 RPU 15 W UHF, dual freq. P Baillon, KMCM, 1218 Pioneer Bldg, St Paul MN 55101. 612-222-5555.

Symetrix 108 8-line/3-hybrid phone syst w/2 consls, nice cond, \$800/BO. Shannon, WRFA, 800 8th Ave SE, Largo FL 34641. 813-581-7800.

Wescom 2- or 4-wires hybrids; 200 Hz-5 kHz audio quality, \$100 ea w/prints. R Weaver, WIH EV, 413 S Fuquay Ave, Fuquay Varina NC 27526. 919-552-8036.

Moseley 303 2-trx, 2-receive. K Kenze, KFXE, 13 E 11th, Wash-ington MO 63090. 314-239-0209.

Comrex LXR single-line rcvr, exc cond, BO. B Clain, Music Dir, Box 51978, Indian Orchard MA 01151. 413-783-4626.

Moseley PCL-505 comp on 948 MHz, \$1500. K Freeman, WBBQ, 1305 Ga Ave, N Augusta SC 29841. 803-279-6610.

Marti RMC 15-S w/manual, \$275. R Chambers, KSUE, 3015 Johnstonville Rd, Susanville CA 96130. 916-257-2121.

TFT 7610, studio OK, xmtr nds wk, \$300/BO; Marti DRT-24 dig xponder, xmtr end only, \$100/BO; RCA: (3) MI-27566 meter alarm panels, MI-27562 remote ctrl/metering unit, (2) MI-27571 metering units, 1 motor-driven metering commutator & 1 w/extra relays on panel. D Carver, KZBK, 107 S Main, Brookfield MO 64628. 816-258-7458.

Marti RMC15 16-chnl, gd cond, \$900; (2) Mark 4' STL dish, gd cond, \$500; (2) Marti STL-8 trx & rec STLs, gd cond, \$800. O Booth, 801-323-4980.

Want To Buy

Scala 960 mini-flectors, STL ant. K Kenze, KFXE, 13 E 11th, Wash-ington MO 63090. 314-239-0209.

TFT 7601/7610 xmtr end only; Moseley MRC-1 studio end only, T McGinley, WPGC, POB 10239, Wash-ington DC 20018. 301-441-3332.

Composite STL xmtr & rcvr. Mark, 210-875-2555.

TFT 7707 stereo rcvr. Mark, 210-875-2555.

SATELLITE EQUIPMENT

Want To Sell

Zenith ZS 6300 dual low noise blockdown converter, \$150. B Reck, WPTL, Box 909, Canton NC 28716.

McMartin SDR-1 IF demod, exc cond, BO. G Reynolds, W2G0AB, 333 Fayetteville St Mall, Raleigh NC 27602.

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Sci Atl 7300/7325 DATS rcvr w/3, 7.5 & 15 kHz cards, \$3000. Shannon, WRFA, 800 8th Ave SE, Largo FL 34641. 813-581-7800.

Microdyne 1100 sat rcvr/down-converter w/LNA & 20' Heliac, exc cond, \$2600. M Vanhooser, KSKY, 4144 N Central Exp #266, Dallas TX 75204. 214-827-5759.

Avcom SCPC 2000E for Tribune & Chicago Cubs baseball, \$950. R Jacobson, Jacobson Bldg, POB 453, Estherville IA 51334. 712-362-2644.

TCS 9000 Telesyst Inmar SAT transportable, sat tele, BO. Several additional items also avail. A Croft, Mutual Bldg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

SCPC SATELLITE AUDIO RECEIVE EQUIP: New & used, many brands, complete units, downconverters, commercial LNB's. All in exc cond, good prices, perfect for low cost SCPC uses. SASE for list. Universal Elects, 4545 Groves Rd #13, Columbus OH 43232. 1-800-241-8171.

Want To Buy

Standard Comm CST-810/CST875 SCPC/subcarrier rcvr. B Davis, WBTV, 1 Julian Price Pl, Charlotte NC 28208. 704-374-3639.

STATIONS

Want To Sell

5 kW AM, univ town, north UT, \$475K. Morgan, 801-628-1000.

FM in cent AR, 3 kW upgradeable to 50 kW. 501-470-1525.

AM & FM in Wyoming, dark, FM can upgrade to full C, \$155K. R Moore, KRAL, 2617 Cutty Sark, Rawlin WY 82301. 307-324-6942.

Profitable in sml mkt in NM, great hunting & fishing, growing community, \$100K building, \$290K 1/2 down, balance @ 8 percent. J Conner, 6 E Linda Ln, Gilbert AZ 85234.

25 kW CP in Susanville CA, exc site; 25 kW CP in Laramie WY, \$18K. D Ganske, KIKR, 5546-3 Century Ave, Middleton WI 53562. 608-831-8708.

Bdct facility for talk/news/music, late high qual equip, 14'x30', 2-axle mobile, less than 5 yrs old w/AC & restroom. 503-774-0459.

Class C FM in ND, covers major metro, new bldg & equip, assum financg, \$100K down, \$485K. E Stanley, Standef Bldg, Hwy 5 W, Bottineau ND 58318. 701-228-2483.

5kW day/29W nite w/new tower/ground system, w/4 acres in Jacksonville, FL metro market. Beautiful historic beach town. Best cash offer over \$200,000. Bill, 205-238-0281 or Mark, 205-236-6484.

Want To Buy

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Indiv seeks FM CP/dark in mkt of 25K/less. R Ritchey, River City Bldg, 400 Bitters #602, San Antonio TX 78216. 210-490-7487.

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New group seeks AM or FM or non-commercial FM, dark or on anywhere, will consider lease, send or call terms and price to: Radio World, POB 1214, Falls Church VA 22041. Attn Box #04-14-01RW.

STEREO GENERATORS

Want To Sell

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Mod Sci CP-803 comp clipper w/rackmount kit, \$250; Dorrough 80-B, \$50. J Somich, Somich Engrg, 1208 Stoney Run Trl, Broadview Heights OH 44147. 800-334-3925.

Inovonics 705 rack mount stereo with removable FMX, good condition, \$750/BO. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

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Want To Sell

3M Brand bridging video switcher, \$500/BO. Call Mark at 619-598-3311.

Tascam 42B (5); (6) Dynamax CTR-10; Otari MX5050; other equip. R Russ, KBLA, 1700 N Alvarado St, Los Angeles CA 90026.

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Fidelipac Mastercarts many, comm length, \$1 ea/BO; Audiopaks. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Ampex 4-400, \$200. B Lacy, KARX, 3611 Soncy #6A, Amarillo TX 79121. 806-359-4000.

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Library AC/oldies, many CDs, exc cond; Tascam w/3 bal outputs, \$275. M Powell, WWPL, 2802 Lomax Ct, Waldorf MD 20602. 301-843-8821.

Mastercarts (200), Gold, various lengths, \$1 ea; (300) Gray from 70s, \$50 ea. J Callow, WAGN, 413 10th Ave, Menominee MI 49858. 906-863-1340.

Fidelipac Scotch various, \$.75 ea. M Powell, WWPL, 2802 Lomax Ct, Waldorf MD 20602. 301-843-8821.

Large quantity carts, various lengths, 2 1/2-5 1/2 mins, \$.75 ea. M Gollub, WMJS, POB 547, Prince Frederick MD 20678. 410-535-2201.

Airchecks from 50s/60s/70s. B Eckart, OK Classic, POB 803, Mustang OK 73064.

1000 Aristocarts, BO. Several additional items also available. A Croft, Mutual Bldg Syst, 1755 Jeff Davis Hwy, Arlington VA 22202. 703-685-2000.

3M 203 on 10" reels, \$8 ea/BO; 4A Audiopak, various lengths, gd cond, \$1.75 ea/BO. L Snyder, 718-347-2940.

Airchecks from 50s/60s/70s. B Eckart, OK Classics, Box 803, Mustang OK 73064.

Pams Jingles ref tapes, 1951-1976, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625.

Want To Buy

Radio/TV history, various mkts. B Eckart, OK Classic, POB 803, Mustang OK 73064.

Gold Discs 1/all; radio CDs, all kinds. K Kenze, KFXE, 13 E 11th, Wash-ington MO 63090.314-239-0209.

Fidelipac Mastercart II Gold/Audiopak AA-4 2 1/2-4 min lengths, gd cond, many. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625.

16" radio transcriptions from 1930-1950 for cash. J Salerno, Indus Video Services, POB 1487, Bellaire TX 77402. 713-981-9803.

TAX DEDUCT EQUIP

Want To Sell

Christian, new, non-comm, any appreciated, will pay s&h. 414-494-9010.

Educ FM nds any equip. C Hicks, WEAX, W Park Ave, Angola IN 46703.

FM station set up. E Kischuigs, WPWB, 613 Will Scarlet Way, Macon GA 31210.

TEST EQUIPMENT

Want To Sell

B&K 1403 3" oscilloscope/ phase meter, \$75. J Somich, Somich Engrg, 1208 Stoney Run Trl, Broadview Heights OH 44147. 800-334-3925.

Sanborn 323 dual-chnl variable chart spd recorder w/DC amp, 2-chnl & extra rolls paper & access, \$350. S Horner, KMRO, 2310 Ponderosa, Camarillo CA 93010. 805-654-0577.

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TEST EQUIPMENT...WTS

Heathkit IG-52 TV alignment gen w/book & cables, \$35+s/h G Kirby, Gray Fox Video, 13613 US 36, Marysville OH 43040. 614-261-8871.

Key Markasweep 154-C sweep gener w/o markers, solid state, 110 MHz, working, \$50. J Cunningham, KEOR, Rt 2 Box 113 B, Stonewall OK 74871.

Anaconda 9300 sweep spec analyzer, \$2500/BO/trade; Philips PM6507 curve tracer, \$1450/BO/trade. R Katz, Allegro Sound, 15004 Ventura Blvd, Sherman Oaks CA 91403. 818-377-5264.

Want To Buy

Grid dip meter, old, uses 955 Acorn tube. F Hollon, WAHI, Rt 1 Box 72, Plymouth IL 62367. 217-392-2340.

TRANSMITTERS

Want To Sell

Bauer FB 5000J AM 5000/500 W, gd cond, BO. R Trujillo, RT Comms, 10008 Cordova Glen Ct, Sacramento CA 95827. 916-364-5520.

Energy Onix MK 30 30 kW w/exciter on 100.1 MHz, less than 3 yrs old, clean, exc cond, \$28K/BO; Harris TE-3 on 100.1 MHz w/Orban wideband interface, gd cond, \$750. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

FM - TRANSMITTERS

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RCA BTA-1S very gd cond, 1 kW on 1410 kHz, \$5000. T Gaiser, KERN, 1400 Easton Dr #134, Bak-ersfield CA 93309. 805-328-1410.

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LP AM custom made, \$300. J Kesler, 606-843-2209.

LPB RC-25B 20 W AM, \$150/BO. R Schaedel, CWMCR, 6630 Monclova, Maumee OH 43537. 419-893-7968.

Collins 30K-4 high freq, A1 & A3 svc, (2) 30 MHz, 250 W, \$400 or trade/video camera; Bendix TDD-5 AM plate modulated, tube-type, 25-50 W, \$350+s/h. J Cunningham, KEOR, Rt 2 Box 113 B, Stonewall OK 74871.

Exciters: McMartin B-910 tuned and calibrated to your frequency, guaranteed: Mono, stereo, SCA. Goodrich Ent. Inc. 11435 Manderson St., Omaha, NE 68164. 402-493-1886 FAX: 402-493-6821

Collins 830-D1 1 kW FM, gd cond, manuals, spare tube, rem interface w/o exciter, \$2200/BO, Cablewave FL-50J 7/8" foam line, 75", new, BO. M Friend, WTJU, 711 New-comb Stat, Charlottesville VA 22904.

Gates FM 5-C w/SS TE-3 exciter & manual, gd cond, \$6000. J Cunningham, KEOR, Rt 2 Box 113 B, Stonewall OK 74871.

TRANSMITTERS

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Harris MW-1A access ext ctrl pnl. P Salois, KPCR, POB 1 Hwy 54E, Bowling Gree MO 63334.

Collins/Rockwell 310Z-2 FM w/stereo gener, comp input card, manual, unused, \$1250. B Watson, KSAK, 3352 Honeybrook Way #7, Ontario CA 91762. 909-947-8440.

Harris HT-5 FM xmtr. Exc yond. Call Steve or Howard at/CCA Electronics at (404) 964-3530.

Wilkinson FM-250E xmtr, mint, rea-sonalbe, Paul 413-663-8135.

Want To Buy

FM 16-20 kW. G Bonet, WIDB, POB 43, Mayaguey, PR 00681. 809-834-0760.

MMDS TV 2500-2700 MHz freq. H Cambero, 305-380-6001.

Nautel/Harris 10 kW AM. M Berlinger, WDAY, 301 8th St S, Fargo ND 58103. 701-241-5350.

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

WE 1000 W 1935 era. R Steinberg, RC Comms, 3900 N River Rd, Schiller Park IL 60176. 708-678-7000.

LPTV 50 W. J Kesler, 606-843-2209. Studt-run sta sks FM, 15 kW, xmtr & exciter tunable to 89.9, 200' of 1 5/8" Heliac. WUCF, Univ of Cent FL, Orlando FL 32816. 407-823-2133.

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Russco Fidelity Pro stereo TT preamp, gd cond, BO. H Kneller, WKII, 3151 Cooper St #56, Punta Gorda FL 33950. 813-639-1112.

Audio Technica APT-12 12" tone arm w/shell, \$100. J Somich, Somich Engrg, 1208 Stoney Run Trl, Broadview Heights OH 44147. 800-334-3925.

Want To Buy

Disc cutting lathes, Fairchild Imtrs, Neumann, Westrex, Grampian, Presto, related gear. K Gutzke, 612-866-6183.

Rek-o-Kut 16" tone arm hd/Gray assembly. J Gerber, KCHT, 524 Ludington #300, Escanaba MI 49829. 906-789-9700.

Gray/other 16" tonearms. T Knapp, 1937 Valley Dr, Las Vegas NV 89108.

VIDEO PROD EQUIP

Want To Sell

Canon VR-HF800 HiFi stereo, VHS VCR/editr, mint, \$500/BO; VC-40A col camera ster mic, litte gen; Quasar VHS HiFi 4-hd, 3-spd, mint, little use, \$600. J Diamond, Blue Diamond, Box 102C Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

NEC FS-18 frame sync/TBC with new cd, manual, \$500+s/h; Pana 3/4 edit system, NV9600/ NV9240/NVA960, \$2000. D Hurd, Harding Univ, 805 Park St, Searcy AR 72149. 501-279-4017.

Hum buck video, BNC conns, \$50. D Burns, ElectroMan, 5960 Orleans Ave, New Orleans LA 70124. 504-482-3017.

Sony RM-400 U-Matic, both cables w/o book, \$150+s/h; rack mount video DA, 12 amps w/AC pwr sply, old, looks gd w/o book, \$75+s/h. G Kirby, Gray Fox Video, 13613 US 36, Marysville OH 43040. 614-261-8871.

Electrohome EDP58XL 10' diag green screen video data proj, autolock to var scan rates, comp input, very gd cond w/stand & manual, \$375. S Hoffman, CU Theatre, 2800 W Gore, Lawton OK 73505. 405-581-2428.

Want To Buy

Sony/Ampex BVR-50 TBC rem for Betacam; Sony MVR-5600 Pro-Mavica still video rec, \$900. T Dock, 515-225-7800.

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JVC HR 2200U indus port VHS with GZ-53 color camera, deck plays but needs work in record mode, \$199. D Nuechterlein, Allmake Prods, 6130 S Dehmel Rd, Frankenmuth MI 48734. 517-652-6863.

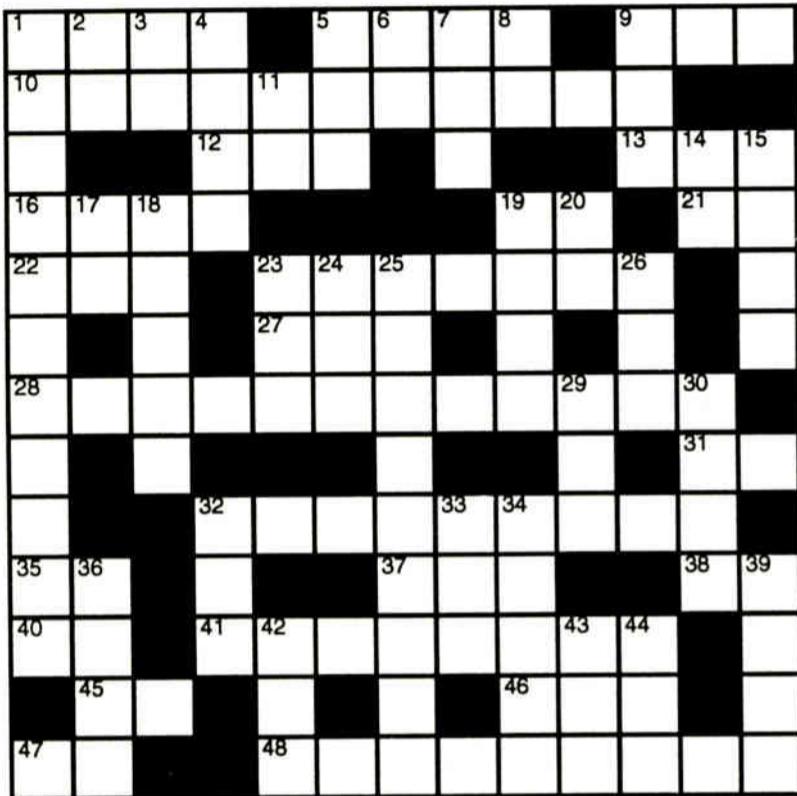
Sony VP-5020 3/4" U-Matic PB, \$650. B Watson, KSAK, 3325 Honeybrook Way #7, Ontario CA 91762. 909-947-8440.

Sony VO 2610 3/4" set with RM 440 controller. M Gatti, Underdog Studios, 771 Farmington Ave, Bristol CT 06010.

Spring Cleaning

Clear out your closets by advertising your used equipment in Radio World's Broadcast Equipment Exchange.

This Month's Crossword



by Steve Walker

solution in next issue of RW

ACROSS

1. Antenna height
5. Egyptian goddess
9. 6th sense
10. "The Sound of Perfection"
12. Pantone color matching system
13. Acronym for a European steel and coal community
16. Low noise amps
19. Length of time
21. Company
22. Charged particle
23. Unspecified large number
27. Logical function
28. CD 10
31. Surgeon's work room
32. "True blue" carts
35. Former
37. Engineer's club
38. Operating system
40. Not _____
41. Digital cart machine with built-in phone interface
45. Musical note
46. Federal agency
47. What transmitters emit
48. The ones with the purse strings

DOWN

1. Expand*Ability
2. Astronomical unit
3. Spot
4. Pointers
5. Revenuers
6. Therefore
7. Writing fluid
8. Silicon
9. Clock maker
11. Abbv. for a relaxation technique
14. Cubic measure
15. Drink
17. Same as 40 ACROSS _____
18. Plate
19. Recipient of estate
20. Regarding
23. Numero _____
24. Mother
25. Portable one is made by Audio _____
26. Radio/TV network
29. Investment
30. Just okay
32. Logical connective
33. Obsolete (abbv.)
34. _____ O'Toole
36. Serial communications signal
39. Cease progress
42. Prefix meaning equal
43. Operations
44. Cheer

ACTION-GRAM

Equipment Listings

Radio World's Broadcast Equipment Exchange provides a FREE listing service for all broadcast and pro-sound end users. Simply send your listings to us, following the example below. Please indicate in which category you would like your listing to appear. Mail your listings to the address below. Thank you.

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 Title _____
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 Zip Code _____
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Signature _____ Date _____

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- I. Type of Firm**
- D. Combination AM/FM station
 - A. Commercial AM station
 - B. Commercial FM station
 - C. Educational FM station
 - E. Network/group owner
 - F. Recording studio
 - G. TV station/teleprod facility
 - H. Consultant/ind engineer
 - I. Mfg. distributor or dealer
 - J. Other _____

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

- II. Job Function**
- A. Ownership
 - B. General management
 - C. Engineering
 - D. Programming/production
 - G. Sales Manager
 - E. News operations
 - F. Other (specify) _____

WTS WTB Category: _____
 Make: _____ Model: _____
 Brief Description: _____

 Price: _____

*Closing for listings is the first and third Fridays for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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Phone: 703-998-7600 PO Box 1214, Falls Church, VA USA 22041 FAX: 703-998-2966

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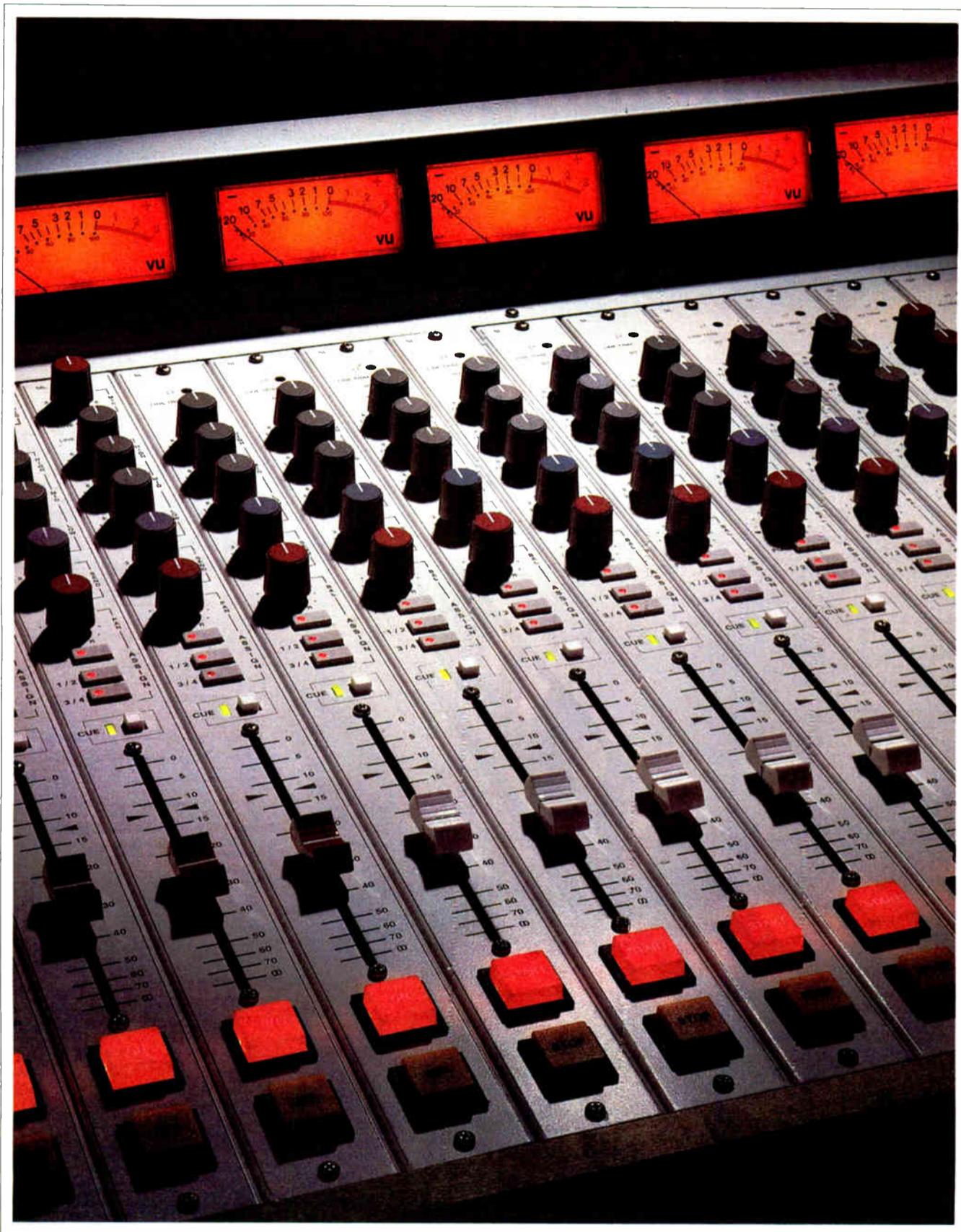
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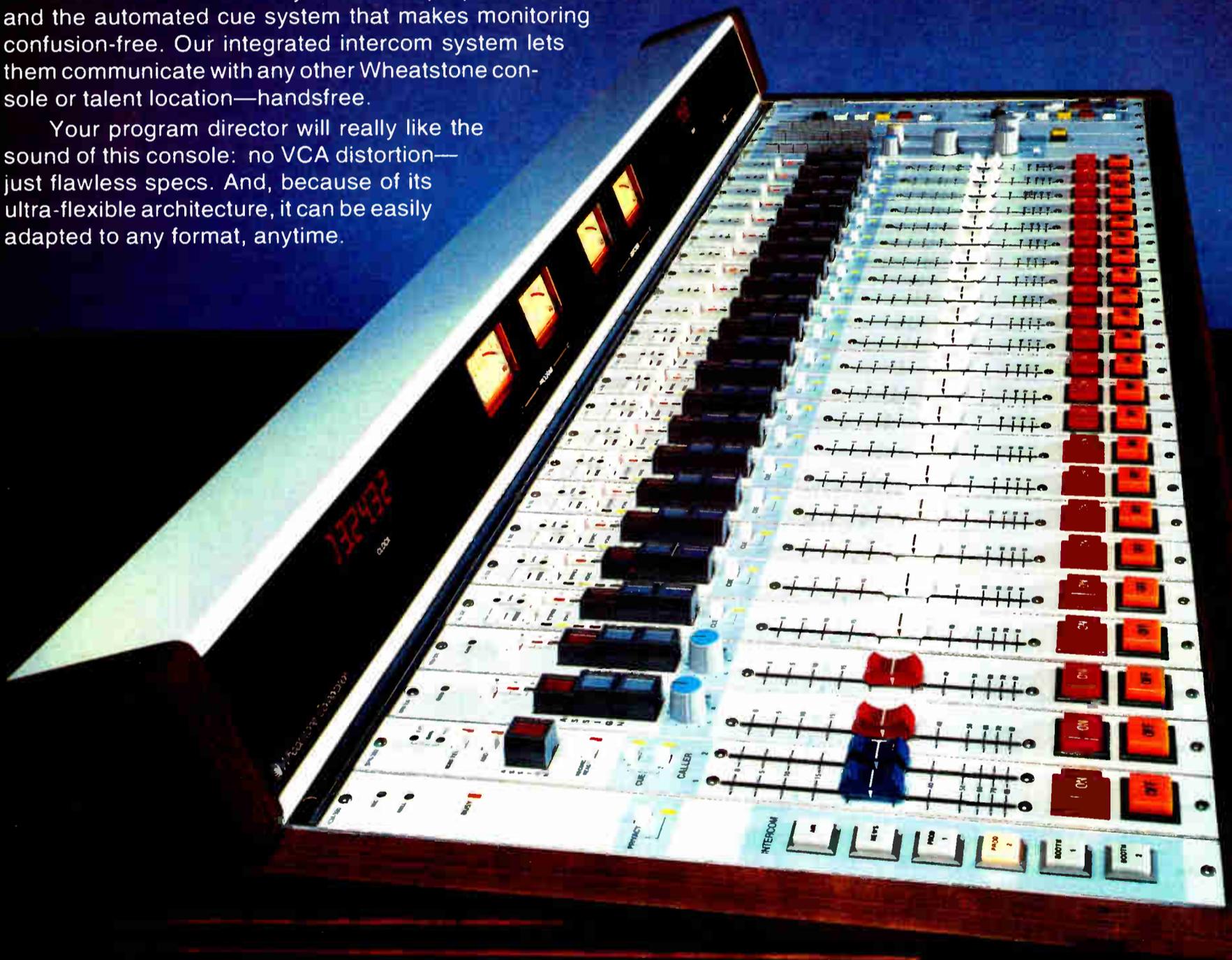
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