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# Radio World

EIA comments on  
**Digital Radio  
 Progress**  
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Vol 17, No 21

Radio's Best Read Newspaper

November 10, 1993

## Radio Sees Increased Growth in 1993

by Nancy Reist

**SAN FRANCISCO** Radio growth has surged in 1993, much to the relief of many who have had to cut costs during the sluggish last two years. Radio group operators have mixed responses to the general improvement, based in part on where their stations are and on the size of the markets they occupy.

According to the Radio Advertising Bureau (RAB) statistics, combined spot and local radio revenues for the first eight months of 1993 were up 9 percent. Gary Fries, president of the RAB, said he believes the growth will continue.

"I feel that this year we'll see a solid 9 percent increase at year's end," Fries said. "I think one of the most important things is that it's coming across all spectrums of radio."

Fries said that due to the recession, advertisers had to reassess their spending habits and focus them on efficient, effective means of advertising. He believes radio has benefitted from this because formats are targeted toward specific consumer groups, so they help advertisers meet micromarketing goals.

### Going after ad dollars

"I think the radio people have become a lot more adept at focusing on getting results for the advertiser versus just

focusing on their own programming and their own radio station," Fries said.

Dean Sorenson, president of Sorenson Broadcasting, echoed Fries' assessment. "I think we're closer to our customers. We're serious about what they are trying to accomplish. We are in unrated markets, so it is very much a relationship sale."

Sorenson said listening to the customers' needs and responding to them has been the key to his stations' increasing success.

He said the "Walmart-ing of America" is both the biggest threat and opportunity faced by Sorenson Broadcasting. Sorenson explained that the super-

regional discount stores have driven some radio clients out of business, but they are also encouraging many businesses to consider radio advertising.

"If we ask the right questions and talk to them about their problems, and not our radio stations, a lot of them will give us the material to respond to and we might be able to help them over that next hurdle," Sorenson said.

Sorenson Broadcasting owns 12 small-market stations in the Midwest which had to cope with the farm crisis of the early 1980s. ("We learned how to run a lot leaner in those days," Sorenson remarked.)

### No recession here

The national recession that hit many radio stations in 1991, however, did not disturb Sorenson's stations. This year, he said, the increase in revenue was greater than usual, but he added that the prosperity had not changed his plans for the stations significantly.

"We're still trying to be traditional, mainstream full-service broadcast stations," Sorenson said. "We're expanding our news efforts in most of our markets."

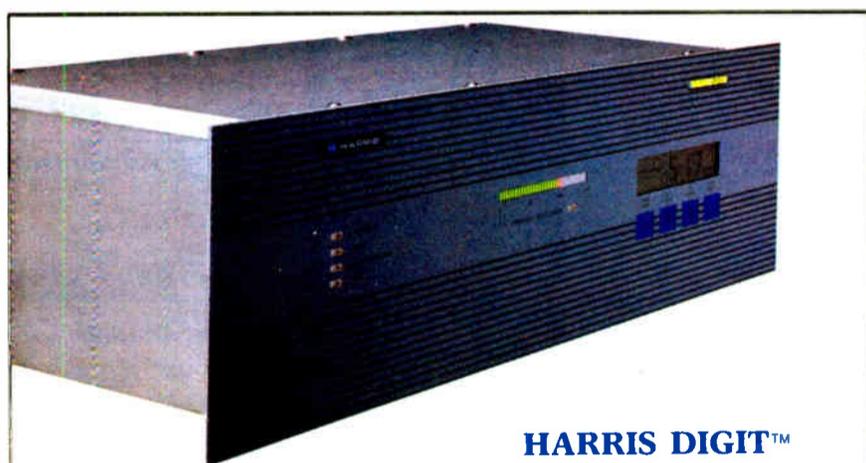
On the other side of the market spectrum, CBS Radio owns 21 stations in 12 markets including New York, Los Angeles and San Francisco. President Nancy Widmann said both the network

continued on page 19 ▶



Westwood One broadcast U2 live from Dublin to 100 million listeners around the world.

See story page 15.



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## Broadcasters Approaching Pivotal Data Transmission Opportunities

by Randy Sukow

**WASHINGTON** Broadcasters are about to set out on a mission of exploration—so much about the business of transmitting digital data over FM subcarriers has yet to be discovered.

Nearly a year after the National Radio Systems Committee (NRSC) approved

its radio broadcast data service (RBDS) standard (RW, Feb. 10), most FM operators are unsure of the potential revenues the standard makes possible.

The most widely publicized RBDS features are well known: display of station call letters, format, song identification and other information on the RBDS radio's small screen while the listener is tuned to the station; automatic tuning to a listener's favorite format when driving through one radio market after another, and automatic activation

of a dark radio in an emergency.

"When the receivers hit the shelves, the stations are going to have to go on the air, whether they are budgeted for it or not," said Almon Clegg, chairman of the NRSC's RBDS subcommittee. "I can't imagine a manager anywhere in the country that would want to see a radio that shows his competitor's

call letters on the front panel. He'll call his chief engineer and say, 'Get me on the air tomorrow morning.'"

Those features certainly enhance service to the listener, but what are the broadcaster's profit incentives for investing in RBDS?

### Vast potential

Local news/talk stations do a good job of updating listeners on traffic and weather developments. But maybe local

continued on page 7 ▶

in depth

-RADIO DATA-

# NEWSWATCH

## Station Sales Up in 1993

**WASHINGTON** Radio stations sales activity increased in 1993, indicating an economic upturn in the radio economy, according to the National Association of Broadcasters (NAB).

As reported in the NAB's "Trends in Radio Station Sales: 1991-1993," compiled by David Schutz, of Hoffman, Schutz Media, Capital, Inc., the total station sales volume of the first two quarters of 1993 was 62 percent

higher than the same period in 1992. The increase was 73 percent higher than the 1991 figures for the same two quarters.

## Wireless Conference Scheduled

**SCOTTSDALE, Ariz.** An educational conference on wireless voice and data communications will be held here on Nov. 11-12.

Sponsored by Alexander Resources, the conference will cover wireless LANS, wireless

telephone systems (PBX) and portable terminals. The expected attendance will include communications suppliers and managers.

For more information, contact Alexander Resources at 602-948-8225; or fax: 602-948-1081.

## NAB Wants "Fair" Fees For Broadcast Sites

**WASHINGTON** The NAB has called on the U.S. Forest Service to establish fair market fees for broadcast tower sites

located on federal lands.

The federal government is considering increasing the fees after years of no increases. Broadcasters had feared a mammoth increase, which was proposed as high as 8,000 percent at one point by the Forest Service.

The NAB supports a federal government advisory panel recommendation that raises fees 200 to 800 percent.

The NAB said that the Forest Service proposal was unfair because it did not use guidelines set by Congress, nor does it consider the "substantial investments" broadcasters make at tower sites including access roads and electricity lines, investment

that can exceed \$500,000.

The NAB said that this investment is made on land that is often remote and "essentially valueless" without the broadcaster development.

## DCI GPS Technology Licensed to Trimble

**CUPPERTINO, Calif.** Differential Corrections Inc., a position/location service provider using RBDS, has signed an agreement with Trimble Navigation Limited that makes it the first licensee of DCI's Integrated Differential ID Global Positioning System.

Under the agreement Trimble, the largest GPS manufacturer in the world, can incorporate the

continued on next page ▶

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proprietary DCI technology directly into GPS receivers. According to DCI, users of Trimble Navigation GPS receivers with ID GPS technology can now receive "highly accurate GPS differential corrections from FM radio stations providing DCI services throughout the world."

**ABC Satellite Services Supplies Country Feeds**

**NEW YORK** ABC Satellite Services recently supplied a record 300 hours of satellite time for National Public Radio Satellite Services and MJI Satellite Services so they could allow 23 stations to broadcast live from the Country Music Association Awards in Nashville.

A fiber optic link connected the Opryland Museum in Nashville to the ABC Radio Technical Operations Center in New York, which enabled 24 simultaneous digital signals that were distributed to the various radio stations.

Robert Donnelly, vice president of engineering for ABC Radio Networks, said the broadcast feed was "one of the biggest and most innovative distribution jobs ever undertaken" by the network.

**Pyramid Receives Investment For Its Continued Expansion**

**BOSTON** Vestar Capital Partners will make a "strategic equity investment" as part of Pyramid Broadcasting's recapitalization.

Pyramid said its recapitalization "will facilitate expansion and position Pyramid in acquiring additional radio properties." The company currently owns nine stations including: WXKS-AM/FM, Boston; WYXR-FM, Philadelphia; WPXY-AM/FM, Rochester; WHIT-AM/FM, Buffalo; WNUA-FM, Chicago; and WRFX-FM, Charlotte, N.C.

Pyramid also has signed a letter-of-intent to acquire WAQQ-FM and WAQS-AM in Charlotte, which will be the company's first duopoly.

**Groups Strengthen Through 'Megadeal'**

by Pamela Watkins

**LOS ANGELES** On Oct. 11, 1993, Westwood One announced the purchase of Unistar Radio Networks, a division of Unistar Communications Group. But within this megadeal, Infinity Broadcasting Corporation flexed its muscle and ended up with a significant slice of the pie.

The following is the anatomy of the deal: Mel Karmazin, Infinity's boss, took over the management of the Unistar network in February 1993. Along with the management agreement, Karmazin had the option to buy Unistar, but according to Bill Hogan president of Unistar, "it wasn't in Karmazin's best interest at the time."

The Unistar network's origins date back to 1980—as United Stations, which offered music programs to local radio. United Stations purchased RKO Radio networks in 1985 and became the United Stations Radio Networks. Later that same year, United Stations bought Transtar Radio and acted as the sales arm for both companies.

**The history**

Transtar, created to deliver radio formats in all size markets, merged with United Stations in 1989, creating Unistar Radio Networks. Since February of this year, Infinity Broadcasting Corporation has managed Unistar.

Infinity owns and operates 22 radio stations throughout the United States, serving 13 of the nation's largest radio markets, including the top 10 largest markets. Currently, Infinity is negotiating to acquire KRTH-FM in Los Angeles and WPGC-AM-FM in Washington.

Westwood One is the second largest radio network in the United States and the largest producer and distributor of radio programming—news, talk, sports and entertainment. Westwood One's

Radio Network division is comprised of the Mutual Broadcasting System, NBC Radio Networks, The Source, Talknet and Westwood One. The star line up in Westwood One's radio network division consists of Larry King, Bruce Williams, Pat Buchanan, Jim Bohanon, Casey Kasem, sports, news syndication, special events programming and much, much more.

Now back to the current Westwood/Unistar/Infinity deal. Westwood One will purchase Unistar's network business for \$101.3 million. Since Infinity had the option to purchase Unistar, included in the deal is Infinity's purchase of five million newly issued shares of Westwood common stock at \$3 per share, which constitutes a large stock voting block for Karmazin, but not control.

**Option to buy**

Karmazin also has the option to purchase an additional three million shares at the same price, once the deal is approved by the Westwood shareholders. (The transaction must go through the government required review period under the Hart-Scott-Rodino act.)

"The \$101 million is Unistar's debt and we will take over that debt," said Laurie Peters, director of public relations at Westwood One. Mel Karmazin will be Westwood One's new CEO and

Norm Pattiz, owner of Westwood One, will continue as Chairman of the Board. "We anticipate the deal to be completed with Westwood as the parent company by the end of the first quarter in 1994," Peters said.

Not only are Norm Pattiz and Mel Karmazin excited about the joining of Westwood and Unistar Radio networks, but also the advertisers are "excited, and believe network economies are coming back," Hogan said.

"Combining the two networks," Hogan said, "wasn't done for debt reason, but because from a business viewpoint it would benefit both Unistar and Westwood One shareholders."

"It was a perfect time for the two to combine forces. Since the announcement, stock has already gone over five dollars a share. It's a win, win, win situation," Hogan added.

Westwood One has a strong grip on youth programming and Unistar's programming is more adult oriented, which makes for a good marriage," Hogan said. "No radical program changes are anticipated, business as usual with both companies operating as autonomous entities except when it is mutually beneficial to combine, such as in sales."

However, after the deal is completely final, whatever works best and whatever Karmazin wants to do will be the order of the day, Hogan suggested.

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# Power Lunches, NAFTA & the Fairness Doctrine

WASHINGTON One of the nice things about working "inside the Beltway" is being so close to many of the places of power—and by extension, meeting some of the players that come and go in the political arena.

Case in point: A few days ago I had lunch with Larry Smith, vice president of international sales, communications sector, Harris Corp. Larry was in town because Harris was one of a group of U.S. companies invited by The White House to participate in an event designed to show the media and members of Congress that the North American Free Trade Agreement (NAFTA) is deserving of support.

During the course of last year's presidential campaign, politicians dusted off NAFTA (which was practically a *fait accompli* at the end of the Bush administration) and used it as a weapon to instill fear (of job losses and a mass exodus south of manufacturing plants, etc...) and manipulate the electorate.

In a nutshell, NAFTA is a multilateral trade agreement that would create a \$6.5 trillion market, consisting of roughly 360 million Canadians, Mexicans and Americans. Harris, and other NAFTA supporters, believe that the pact will level the playing field for



U.S. companies. According to Harris' position paper on NAFTA, U.S. exports to Mexico have grown rapidly in recent years and the U.S. has a "substantial and growing trade surplus" with

Mexico despite barriers and other one-sided tariffs. Harris believes NAFTA will create opportunities for continued U.S. export growth of the kind of products that create high-paying jobs back home.

I enjoyed talking to Larry because he brings a global perspective to the issue. Harris has managed to grow its business in Mexico, despite tariffs levied against its products (ranging from 15-20 percent), and despite competition from Japanese and European products manufactured in Mexico. The agreement would eliminate virtually all those tariffs.

And whether you agree with NAFTA or not, what was salient about that lunch at The Press Club in downtown Washington, not one mile from the hallowed halls of Congress, was the responsibility the media must bear in all this politicking and posturing.

If it seems I'm leaping from one subject to the next, I'm really not. As I sat there eating lunch at the Press Club (with all its memorabilia and allusions to the free press and First Amendment) I reached a moment when things connected to one another. We were talking NAFTA and I started thinking Fairness Doctrine (bear with me here).

Talk radio continues to reach new heights of popularity. Listeners care what you say on their radio station. And I ask you, Are you saying enough? Are you presenting all sides of the issue? When politicians tug at the heartstrings of constituents with a few well-turned phrases, are radio personalities educating themselves to the point where they are ready to respond with the facts?

A few years ago, while covering radio for my previous employer in New York, I had the opportunity to listen to Barry Farber on a panel, discussing hate radio. His advice then was to educate yourself and respond to emotion with facts.

I say: Cover your bases and ensure that you are presenting the most-balanced picture you can so that neither Congress nor any other regulatory body will have a leg to stand on when trying to reim-

pose the Fairness Doctrine on you. It makes for better radio and it ensures your continued viability as a disseminator of information.



I have another bit of news for you from the Society of Broadcast Engineers (SBE). Chuck Kelly Jr. was elected president of the SBE, and Terry Baun was elected vice president.

Kelly's one-year term began during the SBE gathering (see coverage, this issue). He most recently served as vice president and has been an SBE member since 1980. Kelly is director of international sales for Broadcast Electronics in Quincy, Ill.

Baun is principal of Criterion Broadcast Services in Milwaukee.

- Susan N. Crawford has joined Jules Cohen & Associates, P.C., Consulting Engineers as a senior engineer. Crawford was formerly employed as a senior engineer at Silliman and Silliman.

- Broadcast Equities Inc., parent company of StandardNews, Zapnews, and Standard Broadcasting Network has named Shirley Thornton vice president, sales and development. Thornton's experience includes four years as owner of an advertising agency, general manager of CBN Radio Network, and general manager of the Standard Broadcasting Network.

## A New Forum for Radio's Contract Engineers

Note from Tom McGinley, RW Technical Advisor:

It is estimated that well over half of all radio stations' technical service needs now are provided by outside contract engineers instead of full time or even part time chief engineers who are employees of the station. Up to now, the trade press has almost ignored the business of contract engineering.

Radio World is now changing that with the addition of this new bimonthly series, devoted to the trials, tribulations, concerns, business practices, case studies, client relations, horror stories, and whatever else can be helpful or enlightening to contract radio engineers.

Topics will be wide-ranging, but will focus more on the business of contracting rather than the pieces which deal with fixing specific hardware. Those kinds of articles also are very welcome, but will appear in John Bisset's Workbench.

I'd like to invite any contractor to participate in this forum by submitting appropriate articles, roughly 800 to 1000 words, typewritten and double-spaced, preferably in WordPerfect (via modem or diskette) to either myself or RW Editor Lucia Cobo.

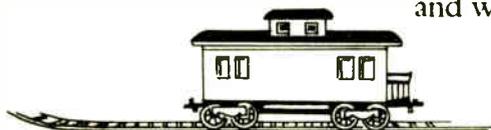
We start the series with a thought-provoking submission by well-known Midwest contract engineer Mark Persons.



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### Wrong stereo choice

Dear RW,

It seems incredible to me that the FCC is about to declare the inferior AM stereo system the American standard. I say incredible because anyone, and I mean anyone, can with a good multi-mode AM stereo receiver, discover quickly which system is superior by simply listening.

All the engineering tests done at transmitter sites all over the world pale when the two systems are compared in the real world under actual receiving conditions.

When I was chief engineer of one of the world's finest classical music stations (WQXR-AM-FM New York), I made my choice one weekend on Cape Cod where I was able to compare Motorola C-QUAM with the Kahn ISB AM stereo system using the Sony SRF-A100 multi-mode AM stereo receiver. I saw how Kahn ISB stood head and shoulders above the other in clarity and fidelity, even through nighttime fading.

Just listen to those who tried Motorola C-QUAM and lost part of their coverage areas. This is coupled with C-QUAM's penchant to sway from side to side (platform motion) once sunset arrives and when receiving the signal close to or in the secondary coverage area. These broadcasters were smart to leave Motorola before they lost it all.

I was further illuminated when I installed the Sony XR-A33 multimode AM stereo car receiver and was able to compare our AM signal against our simulcast FM. In the automobile environment, Kahn AM was actually better. About 15 miles from the transmitters and beyond the Kahn ISB system gave full separation when the FM section had gone to "blend" (mono).

I've always had a philosophical problem with this whole business because Americans, by the very nature, will usually side with the underdog. Despite this, many falsely declare the superiority of C-QUAM, which would appear, for

whatever reason, suspicious. Why would these people support rich, pushy Goliath when David has the best system?

It's time to admit the truth and make the Kahn ISB stereo system the American standard, which would finally be a real step forward for listeners all over America.

Zaven N. "Doc" Masoomian  
Plano, Texas

### Ban 'THE BIG ONE'

Dear RW,

In response to Alan Peterson's "Sometimes You Just Have to Fight 'THE BIG ONE'" (RW, Sept. 22), having worked in a variety of positions at my radio stations, I have witnessed firsthand the pressure from the sales department to air commercials and promotions that involved questionable material. This can range from a spot that does not fit the format to copy that does not fit community standards of decency.

Alan covered the full range of arguments for and against airing such material. I have heard them all before, but his writing perspective and style forces the issue. It is just not possible to read his column and remain neutral and uninvolved.

Over my lifetime, I have witnessed an accelerating decline in morals and decency in America. This has been mirrored, and at times led, by the media. Though as a contract engineer I am usually not directly involved in these types of decisions, I have continued to vigorously oppose further compromises, exerting whatever influence I may have on the decision makers. It is encouraging to find another broadcaster willing to stand up for his principles. Thank you for your courage in publishing this column.

James A. Bender  
President, Montanavision Inc.  
Bozeman, Mont.

### EBS in error

Dear RW,

I found the recent articles on the Denver Emergency Broadcasting System tests (RW, Aug. 11) to be very helpful in forming some sort of opinion on the direction the "movers and shakers" are taking.

I regret that part of that opinion is that these tests were, in part, posturing for the FCC's representative in the hope of future revenue for the companies involved. This is what happens when the FCC abrogates its responsibility to set rules and procedures and leaves it up to us in the marketplace.

Regrettably, it also fails to address the problem front-on and with a method that quickly and efficiently results in a solution. The goal is to save lives and protect property, not to develop a "system."

Some very good things have come out of this. Eliminating the "daisy chain" is a good thing. The exploration of non-station-carrier distribution is a good thing. The exploration of a visual and aural distribution is a good thing for hearing impaired individuals.

Alerting the public through special receivers or requiring additional circuitry on sets purchased after a certain date is a bad thing.

## Radio's Lane On the 'Superhighway'

driven. The technology for getting 8,600 baud on an SCA is not dramatic."

This is purely a business decision. Station operators must consider whether there is a way to turn a profit with this technology. The coming year will be the time for aggressive, pioneering stations to begin experimenting with global positioning, paging service and other data market niches.

This is an age when corporations like Tele-Communications Inc. and Bell Atlantic are coming together to amass capital for the coming communications "superhighway." It is not a question of whether new wired and wireless data services will be created. Be assured, they are coming.

The FCC will soon begin auctioning spectrum to TCI/Bell Atlantic and other consolidated media giants to establish personal communications services (PCS). In a few years, the commission can be expected to grant satellite entrepreneurs frequencies for orbital DAR service with substantial data capacity.

What do broadcasters have to fight such awesome technical and monetary competition?—the upper hand.

It will take unknown billions of dollars to build the fiber optic infrastructure to support PCS nationwide. The network will probably still be incomplete ten years into the next century. Satellite entrepreneurs will have to find backing to build and launch their birds, which will also take years and cost billions.

FM signals reach every square inch of U.S. Interstate Highways today. Broadcasters could be the established wireless data leaders well before PCS and satellites get started.

What it will take is a significant number of broadcasters making the modest investment—less than \$2,000—to begin transmitting RBDS: being ready to go through the whole process again in two to five years when a high-speed data standard is selected, and then going through it yet again when in-band, on-channel DAR is in place.

Broadcasters' decisions in the coming year could be the start of a wonderful chain of events.

—RW

We might all agree that some of the European systems work well. But if we try to copy this, it will probably be no more effective than the system we now have, only more expensive. If you really look at it, we have a system that should work and could work if we had not trained the public to ignore it.

Part of EBS's problem was always the fact that the public became desensitized to the two-tone system by the fact that the constant, weekly testing made hearing the tones routine.

Everyone assumes when they hear the tones that "this is a test." I "surveyed" a dozen or so kids at my daughter's high school and found out that when their favorite station plays the EBS signal, they immediately punched the button.

They had been trained by the system that the tones meant a test for 60 seconds and that they did not want to listen to that. Those that said they did not push the button said that they did not pay any attention to the message because "it was always a test."

By the way, this survey was after Hurricane Andrew damaged our area.

If we are serious about public responsibility for disaster information, we need more public input. The Denver tests seemed to indicate little improvement in the numbers of people who responded to hearing the tests and responding to them. Perhaps more would have responded to hearing the obnoxious two-tone noise than the change in picture or the flashing of a message on a small screen on the front of the radio.

What is really needed is a highly reliable low-tech system that the public will believe. Generating confidence from the public is not a matter of technology, but

The business of transmitting data over FM subcarriers differs from digital audio radio, AM stereo and other issues involving broadcaster investment in new equipment to upgrade service.

Says Almon Clegg, chairman of the National Radio Systems Committee's Radio Broadcast Data Service subcommittee: "I don't think this is technology

of delivering the goods. If the industry were somehow able to convey qualified information to the public, simultaneously and accurately, the public interests would be better served than with a system requiring the purchase of new radios and TVs.

The planners need to incorporate new thinking and to include other industries that are in the business of transmitting information quickly and reliably, like the telephone and cellular companies.

If broadcasters can be required to buy, maintain and operate the needed equipment for EBS, then these companies can be required to help too. Distribution of the EBS information can be by phone line and RF link in addition to other methods of broadcast level transmission.

Redundancy in the system is needed. Hurricane Andrew proved that some of the things supposedly safe from storms sometimes get damaged as well, such the National Hurricane Center, which was disabled for a time by the storm.

If we are unwilling to really shoulder the responsibility, we might as well leave EBS as it is and look upon it simply as a regulatory requirement, violations of which are a source of revenue for the FCC.

J.L. Sorensen  
Chief Engineer, WTPX(FM)  
Fort Lauderdale, Fla.

### Correction

The Sept. 22 article on the expanded AM band mistakenly referred to an AM station with 1,000 kW. It should have read 1,000 watts.

**Radio World**  
Vol. 17, No 21 November 10, 1993

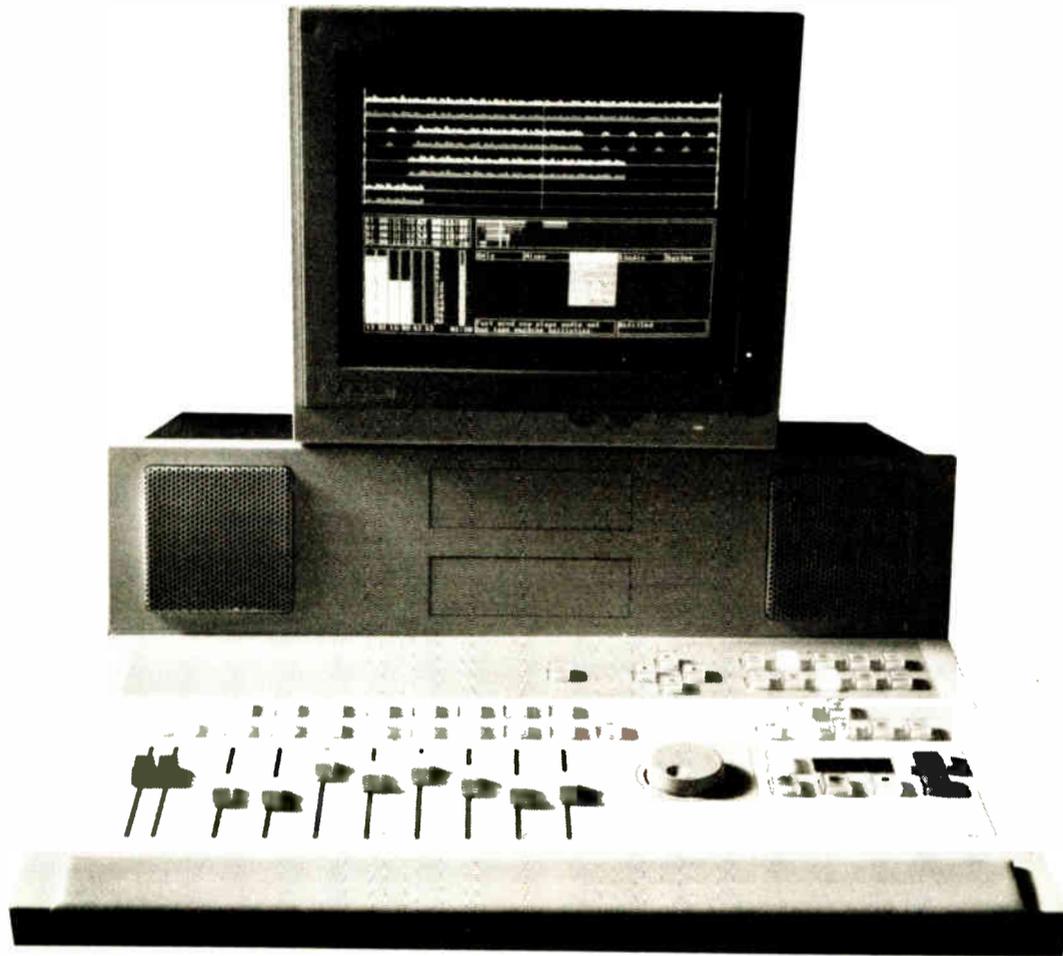
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 Radio World (ISSN 0274-8541) is published semi-monthly by Industrial Marketing Advisory Services, Inc., 5827 Columbia Pike, Suite 310, Falls Church, VA 22041. Phone: 703-998-7600, Fax: 703-998-2966. Second-class postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send 3579 forms and address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. Copyright 1993 by Industrial Marketing Advisory Services, Inc. All rights reserved.

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**Next Issue of  
Radio World  
November 23, 1993**

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# New Datacasting Options Considered

► continued from page 1

governments would pay broadcasters to transmit real-time traffic and weather data to warn drivers of the obstacles that lie ahead and how to avoid them.

RBDS can transmit Global Positioning Service (GPS) data, electronic maps to give a driver his exact position. Perhaps trucking fleets, cab services and other organizations with several vehicles in the field would be willing to subsidize such a service.

A small fraction of 3,000 FM broadcasters have started second revenue streams by leasing subcarrier capacity to electronic paging companies. RBDS could be a cost-effective way for many other broadcasters to get into the paging business.

Might RBDS transmission prove to be an effective advertising medium?

RBDS service developers have devised

receivers now available.

Just as the RBDS marketplace begins to be clear, broadcasters will be presented with a whole new set of questions and potential money-making services through high-speed data systems, far surpassing RBDS capacity.

## RBDS v. high speed

The RBDS standard allows a station to transmit data on an FM station's 57 kHz subcarrier at a data rate of 1.2 kilobits per second (kbps). But waiting in the wings are several developers of systems operating at bit rates of 16-20 kbps.

Gordon Kaiser, chairman, CUE Network Corp., Irvine, Calif., a well-established subcarrier paging service, recently went as far as to say that RBDS is already obsolete and broadcasters would

be "nuts" to install 1.2 kbps systems (see commentaries, page 11).

Kaiser's pro-RBDS opponents say his main objective is to protect the established MBS paging technology, which also operates on the 57 kHz subcarrier at 1.2 kbps. Kaiser responds that RBDS will yield less capacity for paging systems and is a poor substitute for

MBS. He urges broadcasters to wait for more advanced high-speed data subcarrier technology.

FM data broadcasting at 1.2 kbps and various bit rates up to what is called "high-speed," is actually relatively old technology. Europe's radio data service (RDS) standard, on which NRSC's RBDS is based and which is fully compatible with RBDS, is nearly a decade old. Development of the system under the auspices of the European Broadcasting Union began in 1976. The RDS standard was first published in 1983 and finally

approved in March 1984.

TDF Paging, Palm Beach, Fla., has been marketing its paging and data transmission service for FM subcarriers since 1982. Today its service is transmitted outside the U.S., "primarily in Russia," said TDF's John Canaday. The system operates at up to 19.2 kbps on the 67 kHz subcarrier.

in depth

-RADIO DATA-

Data SCA systems have also been available in the U.S. for several years. Modulation Sciences Inc., Somerset, N.J., for example, builds and markets a 4.8 kbps data transmission system, the Model DSCA-188 Data Sidekick Data Subcarrier Generator, and SCA receivers. Both are off-the-shelf items, designed for transmission on the 67 kHz or 92 kHz subcarrier (other frequencies are available on special order).

"In fact, at the Radio Show in Dallas, all the public transit vehicles had the Modulation Sciences SCA system," said Art Constantine, Modulation Sciences vice president, sales and marketing. The system is used for news and advertisements displayed on screens in the buses.

Most observers say that once there is a high-speed digital standard (a new NRSC high-speed subcommittee was scheduled to hold its first meeting in Washington on Nov. 3), it is likely to be compatible with RBDS. Both technologies may well operate side by side.

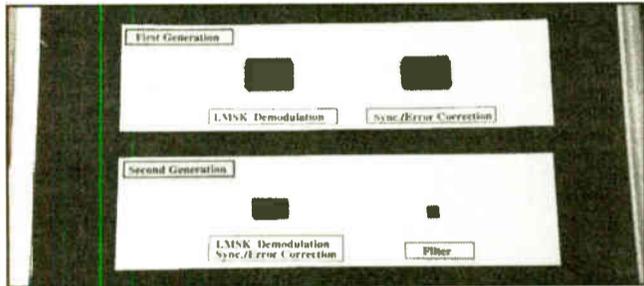
"I think RDS will have some unique functions and a unique place and I don't really think there will be much competition," said Larry Karr, chairman, SCA Data Systems, Santa Monica, Calif.,

which manufacturers RDS generators and receivers. "RDS is a very robust method of transmitting some information."

"We're a big supporter of having a standard in the high-speed area," said RBDS entrepreneur Ron Haley, chief operating officer for Differential Corrections Inc. (DCI), Cupertino, Calif. But for now, RDS/RBDS is a worldwide system that can be a profit source almost immediately, he said.

Broadcasters and RBDS encoder manufacturers tend to be slightly unsatisfied with the pace of the consumer electronics industry's RBDS product introductions in the U.S. "To satisfy me, I would have like to have seen (RDS receivers) out two years ago," said John Casey,

continued on page 8 ►



At the NAB Radio Show in Dallas, NHK demonstrated the recent improvements in ICs for its LMSK data receivers. A full field demonstration is scheduled for the Las Vegas show in March 1994.

ways to exploit all of these applications and are constantly on the lookout for others.

It appears that 1994 will be the pivotal year for RBDS. Encoder manufacturers say several radio groups and individual FM owners have made room in their 1994 budgets for RBDS installations. Currently only about 100 stations are geared for RBDS (RW, Oct. 27).

Several consumer electronics manufacturers that have been showing prototype RBDS receivers over the past year are expected to announce widespread receiver availability beyond the handful of



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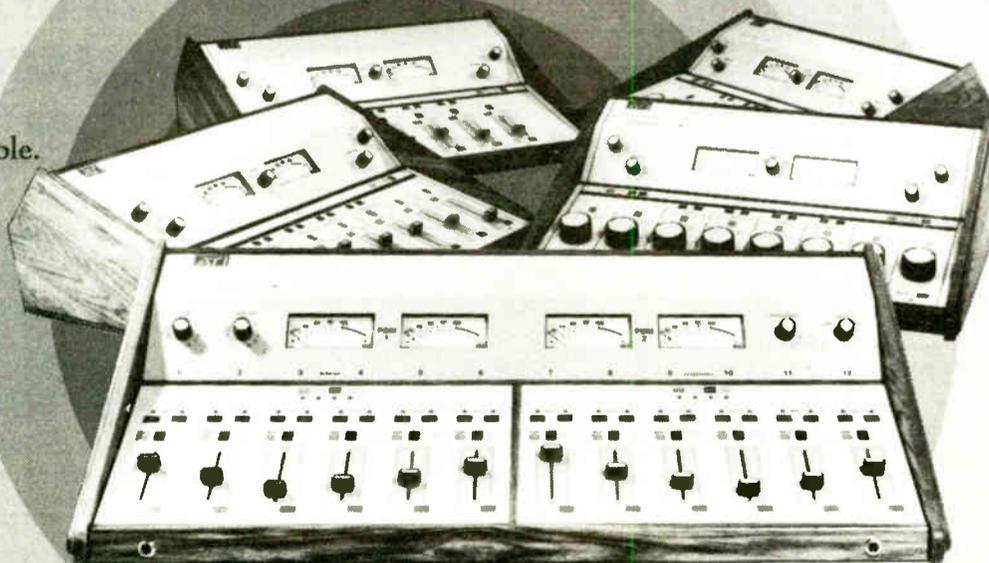
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# New Datacasting Options

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head of the sales engineering staff at RE America, Westlake, Ohio.

## Receiver availability

But Casey has nothing but praise for Onkyo and Denon, the only two companies now offering receivers, which are reportedly selling well. "In the case of Denon, we're back-ordered on all three models of our radio," said Clegg, who serves as a consultant to Denon together with his NRSC activities.

Delco has announced that RBDS will be offered as an option on General Motors cars beginning in mid-1994. Consumer electronics industry sources say entry into the U.S. will be gradual and cautious as companies try to avoid the "chicken-and-egg" trap of over-selling a new broadcast product.

Blaupunkt, for example, is planning its U.S. introduction for mid-1994. "As long as we don't have receivers out there for it, the broadcaster doesn't see any incentive the purchase it," said Blaupunkt's Frank Honold. "It's an investment for him, but not a substantial investment." (RBDS encoders can be purchased for well under \$2,000.)

Receivers may be available, but some say the early models will not catch on with consumers because they do not take advantage all the RBDS standard's features.

Modulation Sciences, which markets its own Model RDS-1 RDS/RBDS Coder, says it will soon introduce its own receiver designed to process RDS's 120 bps of excess data capacity that other

receivers do not use, Constantine said.

Another RBDS receiver soon expected to be on the U.S. market will allow for display of alphanumeric information, even when tuned to an AM station (see story, this page). PRS Corp. of Hong Kong already markets the ID-Logic receiver, which automatically displays call-letter, format, city and state information accessed from built-in database in the receiver.

The coming generation of hybrid RBDS/ID-Logic radios will automatically update the database when it receives an RBDS signal to do so. (Current ID-Logic receivers require consumers to reprogram manually.)

"It covers all AM stations as well as all FM stations that do not have an (RBDS) encoder," said PRS President Pierre Schwob. "If we are optimistic, three to five years down the road, let's say 50 percent have an encoder. Half the time the user is going to think his radio is broken because nothing happens, unless he has ID-Logic."

Perhaps the most significant aspect of the RBDS/ID-Logic receiver is the potential for even more sophisticated new data services as the storage capacity of the database chip increases in future models. "The only thing we have in our inventory now is ideas, and we don't like to talk about our ideas unless we're ready to go to market with them," Schwob said.

## RBDS services

The radio data business will depend on the availability of receivers simultaneously with the introduction of new,

continued on page 10 ►

# AM Data Broadcasting Potential Is Uncertain

Sometimes lost in the discussion of all the things that can be done with FM subcarriers is the question of what becomes of AM in the data broadcasting future.

It has not been completely forgotten by system developers and standards committees, but physical law is not on the older technology's side. AM system development has progressed more slowly than expected.

"There are several ways you could do it, but AM has such a narrow data channel, you just can't get the same service you get on FM," said Almon Clegg, chairman of the National Radio Systems Committee's RBDS subcommittee.

"We could do roughly half of what we're doing with FM in AM," said RE America's John Casey. "To put out call letters and format seek, for that stuff it would certainly be possible to do effectively."

When the NRSC first approached the task of setting a U.S. version of the European RDS standard in 1989, there was no European AM model. Several broadcasters insisted that AM be considered along with FM. But when the RBDS/FM standard was approved last January, the AM subgroup was far from a decision.

Besides the inherently smaller data capacity compared to FM subcarriers, AM systems development faces other difficulties. One approach, attempted by some developers, requires an audible two-tone on the main channel whenever an RBDS message is sent. Another system, developed by Rohde & Schwartz, is not compatible with AM stereo. However, a stereo-compatibility breakthrough may be near.

During the recent Baltimore-area field

tests of alerting technologies for the new FCC Emergency Broadcast System (RW, Oct. 13), a stereo-compatible AM system was demonstrated by Sage Alerting Systems over 1630 kHz (a temporary, experimental authorization).

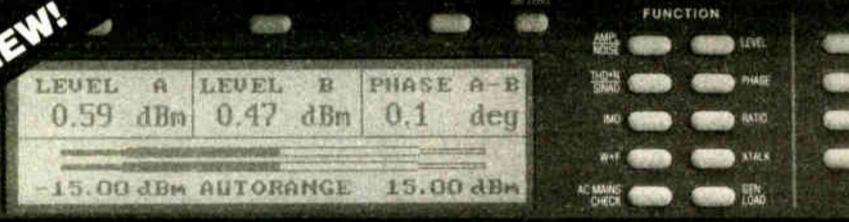
"It worked like a champ...It did not confuse the AM stereo radio to think that its RDS signal was stereo," said Sage President Gerald LeBow, who consulted with Rohde & Schwartz engineers in the months preceding the Baltimore tests. "You're phase modulating the carrier and AM stereo also phase modulates the carrier, but they're doing things at different rates and different degrees and the question is whether the two would fight with each other."

Sage and Rohde are not ready to make a definitive statement about stereo compatibility, but the Baltimore demonstration was encouraging. The AM/RDS demonstration was not on the formal test schedule, so the results will not be included in the EBS test filings. Sage will provide further details of the demonstration in the next round of EBS comments at the FCC, LeBow said.

Even if no AM standard is ever approved, many listeners will at least be able to get a display of call-letter and format information. The ID-Logic receiver developed by PRC Corp., Hong Kong, includes a database chip that automatically retrieves such basic information whenever a listener tunes in any U.S. AM or FM station.

The database does not greatly increase the cost of the receiver. "Alpine and Panasonic (ID-Logic models) have been on the market for two years. The first radios were produced at about \$50 additional cost, but now you can buy an ID-Logic car radio for about \$300," said ID Logic President Pierre Schwob.

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# High-Speed Data System Coming Soon

► continued from page 8

imaginative data services to turn the consumer's head.

"We've got very few radio stations right now broadcasting (RBDS). I think you're going to see initially the radio stations driven because of the data applications, to get their call signs out," DCI's Haley said. "Then some of the major networks are going to get to the stage where they put in RDS encoders because of applications like ours."

DCI is offering a global positioning service, expanding on the accuracy of earlier systems developed by the military with its own proprietary Integrated

Differential (ID) GPS technology. Depending on the level of service desired, a subscriber can receive real-time position fixes to within 10 meters, five meters or one meter.

Specialized Communications Inc., Bellevue, Wash., has come up with the MusicBoard, a splashy way to promote radio stations, and in the process, RBDS. Roadside billboards equipped with giant RBDS receivers and screens display whatever data message the station is sending at the time.

A fourth Music-Board has just been activated in Seattle, and the company is following prospects for 31 other boards

in 23 markets. But Specialized Communications' main proprietary interest in the system is its computer software used to automate the RBDS message transmissions, which can potentially be modified to deliver other types of RBDS service.

Sage Alerting Systems has called a great deal of attention to the RBDS standard through its attempts to make radio data the basis of the FCC's new, technologically updated Emergency Broadcast System (RW, Aug. 11). Sage has demonstrated and tested RDS EBS alerts, on consumer radios as well as unconventional receivers, such as pocket pagers and smoke alarms.

The pagers used in the Sage demonstrations were provided by Axxess USA, Metairie, La., a rival company to Kaiser's CUE paging.

"We're a little different. We're actually a system integrator and a system provider and also we manufacture the technology. We're the only people that do that, to my knowledge," said Axxess's Bobby Adams.

The company hopes to be operating its network in the top 50 U.S. markets by mid-1994. Paging is just Axxess's first step into the radio data business. Other, more sophisticated RBDS services are in the planning stages, Adams said.

As attractive as all of these data services may be prove to be to consumers, they are not enough to make RBDS successful, said David Alwadish, president, CouponRadio, New York. "It's the broadcasters that you have to make happy...This radio that the electronics manufacturers want the broadcasters to accept provides them zero benefit, not a nickel," Alwadish said.

Alwadish's idea is to market RBDS receivers with built-in boxes to encode magnetic cards. Whenever a station plays a piece of music, the RBDS signal would carry the artist information and directions on where to buy the album, and writes the message on the card. The customer could then take the card to a participating record store for a discount on the album.

"I think CouponRadio is a great idea, but (Alwadish) has a major hurdle in front of him," RE America's Casey said. The cost of building a coupon printer into radios could substantially increase the consumer price.

With that drawback in mind, Alwadish held a mid-September breakfast briefing in New York with broadcast station group executives, major advertisers and radio manufacturers, in an attempt to forge some business alliances.

"Maybe in about 60 or 80 days, I can announce that an arrangement has been met where a manufacturer is going to make a coupon-ready radio," Alwadish said. The receiver manufacturing cost is reduced by including all the inputs to easily install a coupon printer into an RBDS receiver if the consumer chooses.

Several high-speed radio data service providers have already emerged as the NRSC subcommittee begins considering such systems this month. The high-speed proponents fully expect the final NRSC standard will be compatible with RBDS.

With data transmission capacity over 10 times greater than RBDS's, the high-

speed services could be eventually be dazzling, but the systems demonstrated so far look much like high-speed versions of RBDS systems: paging, global positioning, traffic information systems.

## High-speed players

One of the three major proponents, Japan Broadcasting Corp. (NHK), introduced its system to American broadcasters at the National Association of Broadcasters (NAB) Radio Show in Dallas last September. (A first full field demonstration is being planned for the NAB spring convention next March.)

The NHK system, developed in cooperation with Sanyo Electric Co. and other Japanese companies, appears to be headed toward becoming the single subcarrier data system for Japan, where broadcasters and the government have shown little interest in RDS. After limited consumer

test marketing, a major marketing push in Japan appears likely in 1994.

The system employs what its developers call level-controlled minimum shift key-

ing (LMSK) technology. It transmits at 16 kbps over the 76 kHz FM subcarrier.

LMSK has already attracted a great deal of criticism. "It is only one, not necessarily the best and in a lot of ways the worst (high-speed system) for U.S. broadcasters," said Brett g Porter of Modulation Sciences. LMSK injection levels are variable, which is bound to mix badly with heavily processed U.S. FM signals that sometimes approach 100 percent modulation, he said.

"LMSK technology has been tested, not only in Japan, but also in Sweden and Norway, always with great success."



Axxess USA RDS pager in operation during EBS tests in Denver last summer.

Lucille Allen, marketing manager, Digital DJ, San Jose, Calif., the U.S. representative for LMSK technology, said in response.

Some also complain that LMSK's propagation range does not meet U.S. market needs. "In Japan, the population centers are very tightly packed. In most cases the range limitations of LMSK doesn't hurt them at all," said Jim Chadwick, engineer for Mitre Corp., McLean, Va.

Mitre, one of NHK's rival high-speed system developers, is a non-profit research and development company under contract with the Federal Highway Administration to develop FM subcarrier technologies for its Congressionally

continued on page 12 ►

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## RBDS Can Add To Radio Revenues

by Ronald P. Haley

**CUPERTINO, Calif.** Following the adoption of RBDS/RDS by the NRSC in January 1993, a worldwide standard for broadcasting digital data is now available. More than fifty countries have already implemented the RBDS standard, and about 100 U.S. FM stations are now transmitting RBDS.

To a provider of worldwide broadcast services, this is a real advantage. A user can initiate the service in the United States and continue to receive a compatible service while traveling throughout the RBDS world. This applies to many services, including traffic, paging, message service and differential corrections for global positioning system (GPS) users.

### DCI's interest

Differential Corrections Inc. (DCI) provides differential corrections data to GPS users and will soon provide real time traffic information. These differential corrections enable GPS users to position themselves accurately to within a meter, as opposed to 100 meters without them.

DCI evaluated many current and future technologies prior to deciding on RBDS. It was an easy choice, due to its global compatibility and wide availability—it is an International Radio Consultative Committee (CCIR) standard—as well as its low cost due to the established FM infrastructure and the availability of encoder and receiver technologies.

RBDS is almost a no-cost option to the radio station operator. Implementation costs can run as low as \$2,000 and most other existing subcarriers can operate unaffected. The narrow band (4.8 kHz) implementation of RBDS at 57 kHz allows the popular 67 kHz and 92 kHz subcarriers to coexist with it.

The development of extremely sensitive RBDS paging receivers has enabled services to be operated effectively with injection levels as low as 4 percent, leaving 16 percent available for other subcarriers.

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### POINT/COUNTERPOINT

*During the recent NAB Radio Show in Dallas, Gordon Kaiser, chairman, CUE Network Corp., Irvine Calif., advanced the proposition that the rapid approach of high-speed data transmission systems has rendered RDS/RBDS technology obsolete. Kaiser was vigorously challenged by Ronald Haley, president and CEO, Differential Corrections Inc., Cupertino, Calif. RW invited both men to continue and expand the debate.*

## High Speed Is New Data Answer

by Gordon E. Kaiser

**IRVINE, Calif.** It is time to separate the RDS hype from reality. The reality is that RDS is an outdated technology. There are two basic reasons:

- 1) The data rate is too slow for modern data services.
- 2) The capacity is too low to provide paging in competitive markets.

The other problem with RDS is in the economics.

All RDS proposals assume that subcarriers are somehow free and that broadcasters are going to stop charging for this important piece of spectrum. This is a myth. It has not happened in the last ten years and if anything, broadcasters are becoming more knowledgeable about the data potential of their stations.

Put differently, this is the United States, not Europe. Private markets behave differently than markets where governments own the spectrum and can mandate technology by fiat, regardless of the revenue implications.

### Small RDS gains

The latest suggestion is that American broadcasters will all rush forward, buy RDS equipment and stop leasing their 57 kHz subcarrier just so they can have their call letters displayed on car radios. You can bet that they are not going to do that until there are millions of those car radios in use and even then, it is highly doubtful that they will ignore the increasing revenue potential of the subcarrier.

Subcarriers have two main commercial applications: paging and data. Five companies provide these services in the United States today, leasing the subcarrier over 400 radio stations. None of them use RDS, and for good reason.

In terms of paging, RDS limits the number of potential subscribers to less than a third of MBS. Unlike Europe, paging in North America and Asia is very competitive. Air-time rates are one-third those in Europe. This is a high-volume, low-price market. Limited-capacity systems are a recipe for bankruptcy.

The real issue, however, is data service, and the key service to watch is traffic

continued on page 12 ►

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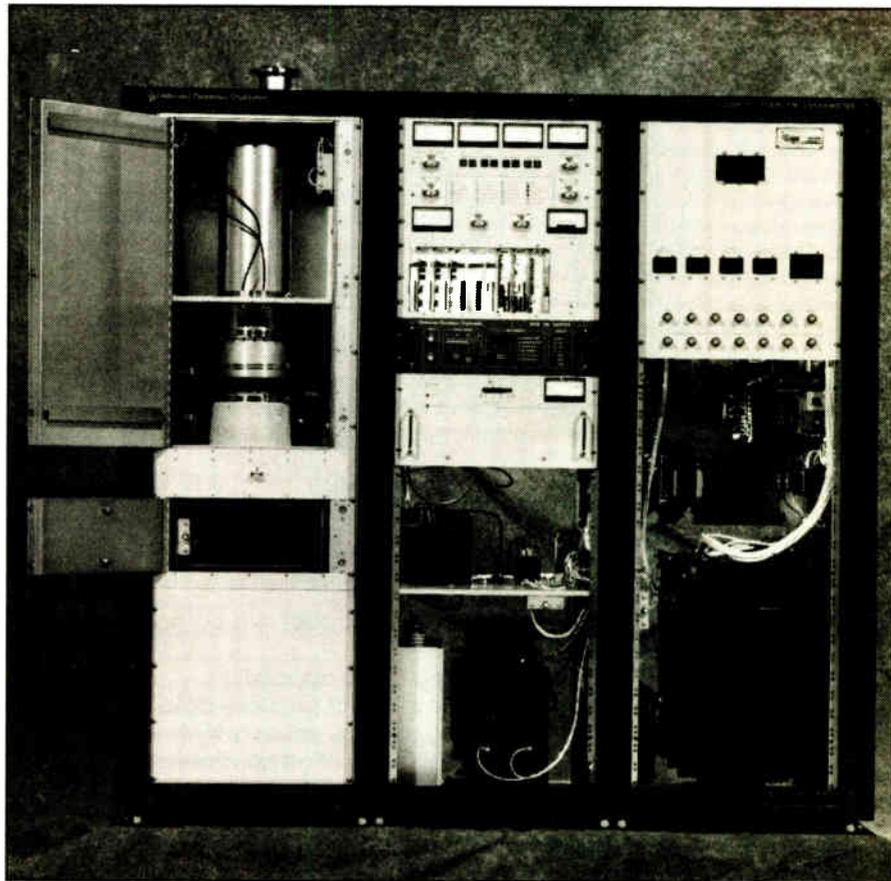
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# Radio Data Faces Many Competitors

► continued from page 10

mandated IVHS (intelligent vehicle-highway systems) project.

Work on the Mitre system began a little less than a year ago and has progressed rapidly at very little cost to the government, Chadwick said, because of advanced computer modeling. The system is designed to operate at 19 kbps on the 72.2 subcarrier. Much of the system's function (at least 5.5 kbps, but preferably 7 kbps) will be focused on digital error correction.

"We wanted to make sure that an area could be served by just one station in the city, because it is state and local govern-

ments that are going to be providing these services, not the federal government. State and local governments don't have very deep pockets," Chadwick said.

Seiko Telecommunications Systems Inc., Beaverton, Ore., is taking the opposite approach. Its system, currently in operation in the Portland area on an experimental basis, requires transmission over several FM stations in the same market.

Last year, Seiko purchased the assets of a bankrupt company that had been working on the high-speed system since the early 1980s. Seiko intends to use the system to market wrist-watch and pocket-watch data receivers, that will receive

paging and information services (not to mention signals to automatically reset the time and date).

"We believe that multiple transmission is the key to mobile reception in multipath areas, not extensive error correction," said Seiko's Gary Gas-kill. Sophisticated error correction, sometimes requiring up to five seconds per message, would also quickly deplete the battery life of Seiko's small watch receivers, he said.

NHK/Digital DJ, Mitre and Seiko have all indicated that they will actively participate in the NRSC high-speed standards group. Look also for significant involvement from TDF Paging and by SCA Data Systems, which experimented with 33 kbps systems ten years ago and currently supplies systems in foreign markets to transmit at 9.6 kbps and 19.2 kbps at 67 kHz.

## The future

If, as many believe, RBDS and high-speed data systems eventually operate together on the FM subcarriers without interfering with each other (in the technical and business sense), the data transmission business may instead evolve into a competition between FM subcarrier systems versus the rest of the communications universe.

"When this originally started out (in the early 1980s), broadcasters had more opportunity than right now because there were many applications," TDF's Canaday said. "What happened is the price of SCA got so high that other technologies replaced those applications (e.g. Ku-band satellite service). Now it is primarily superior for mobile applications."

But even the mobile and portable markets could soon be in danger. RBDS-type services from more sophisticated wireless data systems could be transmitted to the car within the next few years.

The FCC will soon begin auctioning spectrum for personal communications services (PCS), a quantum-leap upgrade

of the current cellular telephone service which is likely to be heavily subsidized by the regional Bell operating companies, long-distance companies, cellular companies and the cable TV industry.

The full marketplace and technical potential of PCS is almost as uncertain as RBDS's, but some envision a world where the average consumer carries portable and automobile computer/picturephone/fax machines. Services like paging and global positioning could be mere afterthoughts for such a device.

Data could also reach the mobile environment through the many proposed satellite digital audio broadcasting systems. Such systems will likely dwarf the data capacity current analog FMs could transmit over their subcarriers.

Broadcasters can take solace in the fact that satellite DAB is not likely to reach consumers before an FM in-band, on-channel DAB standard is approved. Such systems will likely deliver significantly more data than current FM systems.

But FM-IBOC developers agree that the real boost in FM data capability will not happen until the year, decades in the future, when the analog main channel of the IBOC system is removed and FM becomes an all-digital medium (RW, Sept. 8).

Radio data entrepreneurs remain confident in the face of the impending competition. "(PCS) is good, but it is not installed. FM is an installed base and it's proven," said Access USA's Adams.

"One of the best things broadcasters have going for them is the new age of 500 cable channels," CouponRadio's Alwadish said. As consumers gain access to entertainment, data, voice and all other imaginable communications from an increasing number of sources, advertisers will be left with few options to find mass audiences covering all demographics.

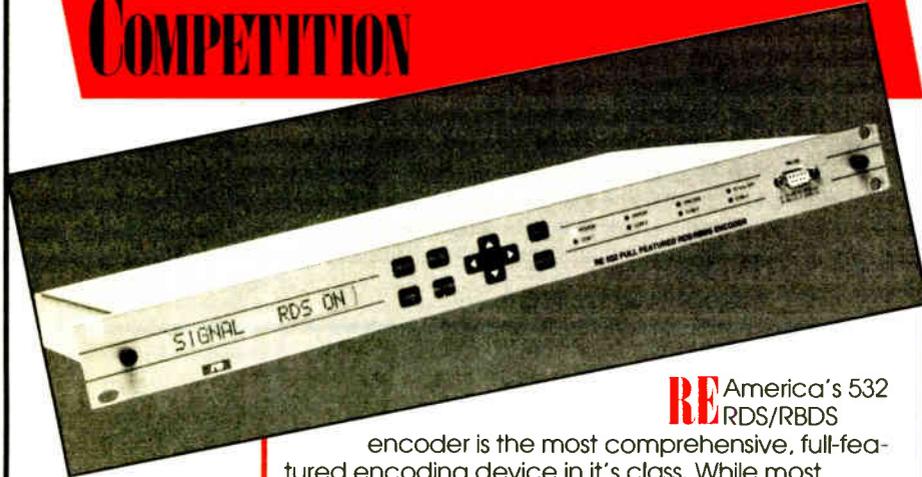
Those advertisers will be naturally drawn back to old, reliable radio, Alwadish predicts: "There is something wonderful about radio."

□ □ □

RW Editor Lucia Cobo contributed to this report.



## THE INDUSTRY'S RDS/RBDS LEADER HAS JUST CRUSHED THE COMPETITION



### RE America's 532 RDS/RBDS

encoder is the most comprehensive, full-featured encoding device in its class. While most American RDS/RBDS encoder manufacturers are building their first product, the RE 532 represents RE's third-generation RDS/RBDS encoder. The RE 532 provides five data ports to enable broadcasters to take full advantage of the revenue potential that RDS/RBDS offers.

Ancillary RDS/RBDS data services such as Paging and Differential Global Positioning (DGPS) are now emerging as major revenue sources for broadcasters. The RE 532 will intelligently manage these services as well as maintain the integrity of the stations RDS/RBDS data, such as call signs, format and radio text.

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## High-Speed Data Promoted

► continued from page 11

information. That was the driving force behind RDS when it was developed almost ten years ago.

The good news is that there will be real-time traffic information broadcast on FM subcarriers. It will become a very important, worldwide service.

The bad news is that it is not going to happen at a data rate of 1,187.5 bps.

### High-speed future

The best evidence of this is the Japanese development of LMSK data broadcasting, or what the Japanese call VICS (Vehicle Information Control Systems). This service has the effective data rate of over 16,000 bps.

For evidence closer to home, look at the notice published in the Sept. 8, 1993, Federal Register by the U.S. Department of Transportation. The DOT wants to test the delivery of traveler information services using FM subcarriers. The proposed operational test will evaluate how the subcarrier can be used to deliver

information to a variety of portable communication devices.

But look at the fine print. The required data rate is a minimum of 8,000 bps.

The proponents of RDS claim that these high-speed data services will not be available in the U.S. for ten years. That is simply not the case.

The DOT proposals are due Jan. 6, 1994, and the operational test will take place during the balance of the year. In Tokyo, NHK will soon conduct the first operational test of VICS.

The reality is that the high-speed data services will be operational in the United States and around the world long before there are any data services, traffic information or otherwise, using RDS.

Broadcasters are sophisticated business people. They realize that they own an important part of the spectrum and that mobile data applications are growing rapidly. They also know that their revenue potential is a function of how much data they can push through the pipe.

# RBDS: Potential Revenue for Stations

► continued from page 11

Even those service providers who currently contract for the full 20 percent injection can provide for RBDS, with less than a one dB loss of field strength—small price to pay for continued access to the sub-carrier.

Incremental revenue opportunities for broadcasters are offered by radio paging, differential corrections and, eventually, real-time traffic specifications. Like differential corrections, traffic messages are well suited to RBDS, where bandwidth usage is not affected by the number of users.

Movement to standards creates winners and losers. Those service providers currently utilizing or interfering with subcarriers at 57 kHz will have to move or modify their products. In almost all cases users of proprietary FM subcarriers have been able to modify their equipment to coexist with the RBDS standard. Those who couldn't will find it increasingly difficult to renew their radio station contracts.

## Major loser

The biggest loser in the acceptance of RBDS is likely to be MBS paging, which will effectively be made obsolete in the United States as it was in Europe. Like RBDS, it operates at 57 kHz. Although the RBDS standard allows for the multiplexing of MBS and RBDS, the battery life of the MBS pager and the resulting network bandwidth make MBS impractical.

The European MBS paging providers all converted to RDS during the 1980s. Coupled with the problem of a single supplier (and a single customer) of MBS pagers, and new competition in the U.S. from both European and U.S. companies utilizing RBDS paging systems, the outlook for MBS is very bleak.

Will RBDS succeed? The competitive nature of the U.S. radio broadcasting market and the commitment to RBDS by major radio networks and broadcasting companies will compel others to follow. In a market where the majority of broadcasters process their signal to increase perceived signal strength, what broadcaster, for the sake of a \$2,000-\$3,000 investment, is likely to allow an RBDS compatible radio to completely skip his station during an RBDS scan of the FM band?

In many cases the data service provider supplies the RBDS encoder free of charge. What advertiser wants to advertise on a station where an increasingly large proportion of the listeners bypass the station because it

doesn't provide sports results via radio text, doesn't provide the music artist's name and is bypassed during scanning?

## Further exploitation

To further exploit the data potential of the FM band, a standard must be agreed upon for a high-speed data subcarrier. This will provide a standard platform for equipment

manufacturers and system suppliers, resulting in both high-

**RBDS is almost a no-cost option for radio.**

performance/low-cost receivers and a flood of applications.

DCI has been working with Teracom of Sweden, the inventor of both MBS and RBDS, to determine the feasibility of utilizing the RBDS compatible DARC system currently under development by Teracom and NHK. It offers data rates of 16 kilobits per second and appears destined to be implemented in Japan next year.

However, adequate testing is

needed to determine DARC's effectiveness in the highly processed signal environment in the United States. Its location at 76 kHz also creates concerns, as it then precludes the use of both the 67 kHz and 92 kHz subcarriers.

The standardization implicit in the adoption of RBDS is the first step toward fully realizing the tremendous potential of FM subcarriers in mobile markets. RBDS is the closest thing the broadcaster will ever get to a free lunch.

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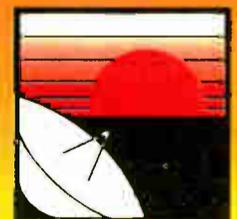
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**Learn to Brag:**  
Mark Lapidus tells  
how in Promo Power.  
**See page 30.**

## U2 Live: Why Irish Eyes Are Smiling

by Annette Deutscher

**DUBLIN, Ireland** U2, dubbed the band of the 1980s and definitely the hottest concert ticket in the world since beginning its U.S. tour of Zoo TV in 1992 and continuing in Europe with Zooropa in 1993, came home to play before a hyped crowd here at RDS Arena.

That group of 40,000 shared U2 with the rest of the world on radio through the technical skill of Westwood One and its Production Director Ron Stephan. The company broadcast the concert live to affiliates in 29 countries, plus the U.S., on Aug. 28. R.T.E. distributed the concert in Ireland and the British Broadcasting Corp. (BBC) distributed it in the U.K. An estimated 100 million people tuned into the event.

Stephan began planning for the concert two months prior to the event. He pointed to what he calls the "Three Ps" as the most important aspect in planning something like this: power, parking and passes.

For the power element of the equation, Westwood One was linked directly into the source—U2's power trucks—via the BBC mobile truck mixing unit. The U2 power trucks provided a link into the BBC truck, both of which were parked right behind the stage area on the street sidewalk. The BBC did the mixing and fed it to Stephan and the Westwood One unit across the street.

From there, it was transmitted by Intelsat to IDB and bounced to Los Angeles, then back across the globe to the Westwood

One stations carrying the event. The satellite was provided by Armstrong Electronics, based in Dublin.

A backup path was set up using a telco loop from the R.T.E. that was sent via microwave to London using a satellite. "We have two solid paths out of here," Stephan said.

Stephan had three sources to the concert at any time, two ways to the BBC and two ways back to the Los Angeles studio.

The backup system was used once, mostly due to over modulation, when lead singer Bono threw his microphone against a stereo stand. Other than that, the main system was used throughout the show.

As for the equipment, Stephan shipped some to Dublin from the U.S. and borrowed some from R.T.E. Other pieces were rented from sound studios and some were from Windmill Lane Studios, which U2 made famous by recording much of its music there.

"Here, it's 50 cycles/240 V, so bringing equipment from the U.S. didn't make much sense," Stephan said. However, the entire Zoo TV stage is wired for 60 cycles/110 V—the American power standard—as are the U2 power trucks.

It was a two-channel mix, with commercials and specials such as interviews with the band and live interviews with the crowd.

A shotgun microphone was placed on the roof of a smaller stand area to pick up extra crowd noise if necessary. The crowd, estimated at 40,000 by Dublin newspapers, added character to the concert by singing

every word to every song and otherwise celebrating the homecoming concert.

Broadcasting from a country other than the U.S. always can present challenges, according to Stephan. From the technical

point of view, power cannot always be guaranteed, although R.T.E. and the BBC went above and beyond the call of duty to help Westwood One. At least being in Ireland meant that the people were friendly and helpful, whereas in some countries that is not necessarily the case, he said.

"Being in a foreign country can pose  
continued on page 32 ▶

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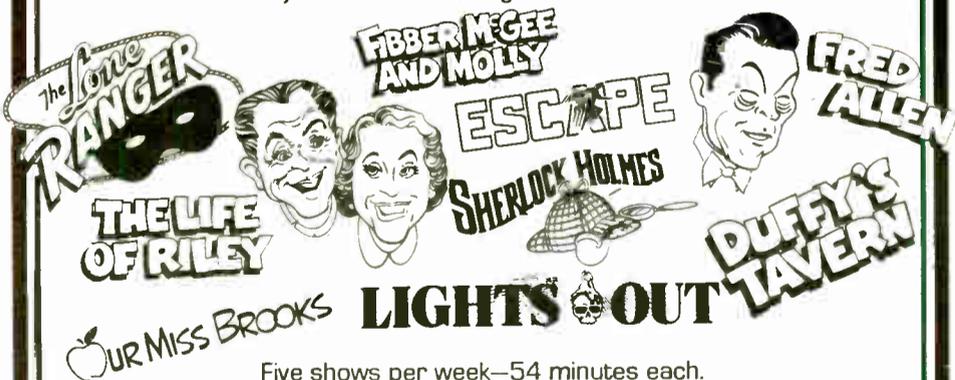
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# Music's Indefatigable Tina Turner

by Charles Taylor

**WASHINGTON** In 1991, she was "Simply the Best."

In 1993, Tina Turner got even better.

A sell-out tour, gold album, a hit big-screen biography and her first U.S. Top 10 hit in seven years. Once again, Turner is showing us why, after three decades, she is a musical force that is not to be overlooked.

In our time, only a handful of artists possess the perseverance, both in terms of industry staying power and personal fortitude, to hold radio's attention for such a

time. At 53, Turner today is as hip and marketable as she was in her original prime with The Ike and Tina Turner Revue.

## Early revolutionary

I was young in the early days of her career—too young, really, to understand the revolution that she and Ike commanded. Even through my youthful eyes, I remember thinking it unusual that a black act sounded like a rock n'roll band. "Proud Mary" was a frantic and somewhat frightening sight for a 9-year-old more used to The Carpenters and The

Partridge Family than this frenetic woman with long, constantly flailing silken hair.

With the 1984 "What's Love Got to Do with It" incarnation, however, Turner and I met on middle ground. Thanks to radio's immediate acceptance and the critical support of the fledgling Music Television (MTV), Tina Turner was reborn for a new generation.

Since, she has accumulated a staggering list of accomplishments that display versatility, dignity and undying zest for challenge, including four U.S. Grammys

in 1985, participation in Live Aid that same year, an unparalleled string of hits across Europe, her appearance in "Mad Max: Beyond Thunderdome" and the Guinness Record for the largest audience ever assembled for a solo performer—182,000 in Rio in 1988.

Even so, in the U.S., Turner's solo star began to dim after the initial whirlwind success of "Private Dancer." Her last Top 10 hit of the 1980s came with "Typical Male," which peaked at No. 2 in 1986. While "Foreign Affair," her fourth solo album, released in 1990, reached multi-platinum status in 14 countries, sales fal-

**At 53, Turner today is as hip and marketable as she was in her original prime.**

tered in the U.S. Radio support grew resistant, as top 40 programmers dealt with declining ratings and searched for something fresh and novel.

## Global stardom

Turner, meanwhile, concentrated efforts in Europe, where she embarked on a tour in April 1990, showing no signs of wear with 125 shows in front of 3.5 million people.

Enter 1993. In May, Turner's first single on Virgin Records, "I Don't Wanna Fight" was released in the U.S. It entered the Billboard Hot 100 at a tepid 83—below two rap songs, a clear indication of American radio's preoccupation with its current trend. In the next two weeks, the song stuck at 66 as radio still held back.

But when Turner's turbulent big-screen biography, "What's Love Got to Do with It," gained immediate public and critical approval, radio found its hook. The movie skillfully traces the singer's tumultuous life with Ike and her eventual escape from his violent and suffocating hold on her. It is at times unsettling and upsetting, and yet makes clear the motivation for Turner's ability to rise from personal and financial despair to her solo triumph.

## Fighting on

As the movie became a Top 5 box office smash, "Fight" worked its way into the top 10 on the pop chart. It also became the second biggest adult contemporary hit ever, holding down No. 1 for seven weeks. Ironically, on the R&B chart, where Ike and Tina were first embraced, the song peaked at 51.

The soundtrack to "Love" has so far sold in excess of 500,000 copies in the U.S. In support, Turner embarked in June on a 52-leg American tour, her first here in six years.

In August, I witnessed one of those performances at an outdoor pavilion in Atlanta. Turner stormed through an inventory of her musical curriculum vitae, from a hellraising romp through "Proud Mary" to her 1980's signature song, "What's Love Got to Do with It," to today's classic "I Don't Wanna Fight."

It was truly a glorious display of endurance and passion from an artist who has managed to reincarnate herself without compromising the convictions and dignity that have made Turner a strong presence for more than 30 years.

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## UPLINK

# New Gear and Services at NAB Radio Show

by Karl Baehr

**LAS VEGAS** I'd like to take this opportunity to review many of the new things I found at the NAB Fall Radio Show in Dallas. For the purposes of *Uplink*, I'll be discussing these products/services regarding application in a satellite station's operation.

The Destiny 2000 is Audiotronics' on-air digital radio console combining the best features of hard-disk system control with the familiarity of an on-air radio console. The Destiny 2000 is designed to work well in automated, live, and live-assist modes. A push of the button switches a station from live drive-time to automated overnights in one move.

Rodman/Brown, who make the Desk-Jockey line of computer satellite feed managers has developed a device called EBS Central that will allow immediate initiation of the EBS process, tones and message from any phone anywhere.

## Acquired by...

Zapnews has been acquired by the StandardNews group and is about to undergo some very positive changes and expansion in service. The other nice thing about this is that now the support from StandardNews will add to Zapnews. StandardNews already offers newsfeeds, actualities and other services via satellite.

Along the newswire, Unistar does have a

service, CNN Radio, that will provide news actualities and feeds to an affiliate aside from their 24-hour CNN Headline News format.

Prime Sports Radio is designed to carry on the tradition of sports on the radio. PSR packages its all-sports programming in three main blocks, AM drive time (6-10 a.m.), daytime (10 a.m. to 3 p.m.), and PM

further enhance the local customization process.

United Press International has been in the news during the last few years, as the entity has been sold and bought and sold again. It is now revitalized and restructured and still very much in business. UPI hosted a hospitality suite at the show, to let everyone know it is still alive and doing well.



The Dallas Convention Center Exhibit Hall

drive time (3-7 p.m.) A total of 14 minutes is available each hour, eight minutes for local affiliates and six for PSR.

The turnkey design of the format allows affiliates to broadcast local sports events, and optional two-hour drive-time windows

A couple of the networks we talked to last year were just debuting new formats so I went back to touch base with them. Jones Satellite Network had just made plans for their CD Country and now the format is going crazy in 50 markets.

You may recall the folks at SuperRadio (City FM and Super Hit Country) who were really just getting underway, as was the National Satellite Entertainment Network (NSE). Well there are more changes for these two networks as they have been acquired by a new group, Major Networks in Chicago.

## Working hard

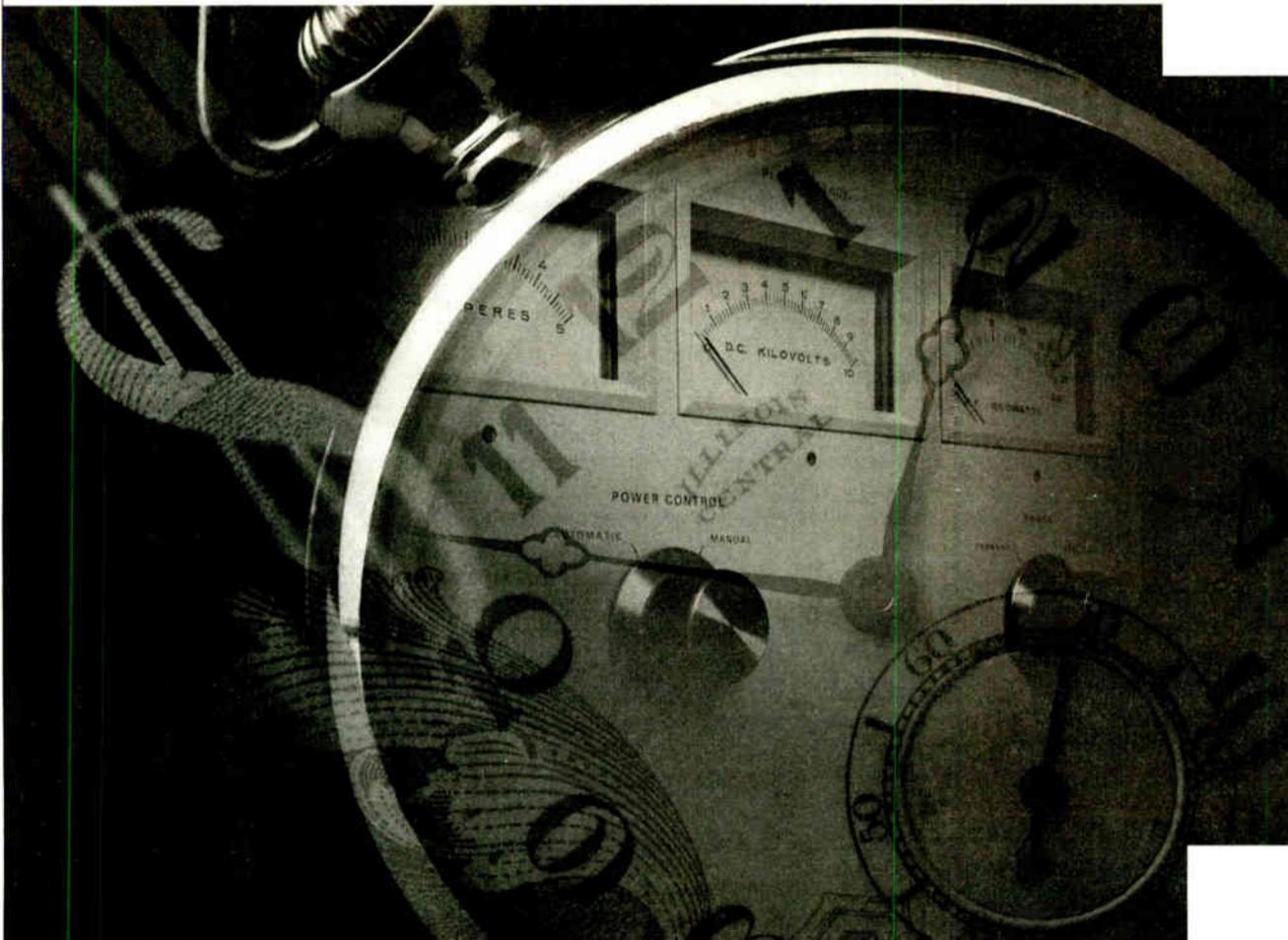
Calling themselves "the working man's PBS," the People's Radio Network continues to push ahead with a diverse offering of "news and information programming that is entertaining."

Winner's Circle Network offers a two-minute commentary by Lou Tice. Currently airing on more than 100 stations, "Winner's Circle" is a free, motivational program designed to help a station increase its billing potential.

Another talk option worth looking at is Talk America. TA offers a variety of programming ranging from Jack Anderson to the Computer Exchange. Around the clock programming is available seven days a week and stations can pick and choose programs to fit their individual needs.

Moody Broadcasting Network's AccuWatch is an exclusive form of ATS (automatic transmitter service) monitoring. It has been in service at religious stations since 1988 but is now being made available  
continued on page 23 ▶

## Now 24-hour operation at a shadow of its former costs.



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For more information, contact Dave Woodworth at the Moody Broadcasting Network at 800-621-7031.

## AccuWatch

## MANAGER'S NOTEBOOK

# Saving Your Breath and Your Money

by Sue Jones

**BURKE, Va.** In the broadcasting industry, we all know that "talk is not cheap." A manager friend of mine once told me that he took all of the chairs out of the conference room and conducted all of his meetings with everyone standing. No one was allowed to sit down.

The reason: shorten the time needed for meetings. He found that everyone came to his meeting prepared. Brevity and clarity replaced political jockeying and long-winded discussions. That may seem like a drastic step but it certainly would alter one's mind-set about meetings.

We can all recall meetings we have attended that were disorganized, lasted forever, and lacked clear direction for the next action steps. I am sure you can recall meetings where some personality dominated the meeting soaking up time and preventing all of the topics from be discussed. These types of meetings can range from boring to frustrating. They are definitely not cost effective.

## Hidden costs

Aside from the frustration factor, we often overlook the cost of meetings. Disorganization costs money. Taking staff away from its regular work for an hour also costs money.

Let's take a look at a sample cost of a reg-

ularly scheduled weekly Department Head Meeting in a medium market station. You can create your own sample with your staff meetings. This type of meeting would typically include the general manager, sales manager, promotions director, business manager, chief engineer, program director, and possibly an administrative assistant.

Take the annual salary of all the participants and divide by 2080 (40 hour work week x 52 weeks) to obtain the hourly rate for each person. If the meeting is typically one hour long, add the hourly rates of the participants. Multiply that number by your benefits package percentage (25 percent in my example) to obtain the true compensation figure.

Because the staff will be meeting instead of attending to normal tasks, double the compensation figure because an hour will be lost for achieving that work. Multiply the true cost of the weekly meeting by 52 weeks to obtain the annual cost of the regularly scheduled weekly department head meeting.

In my medium market example, the figures looked like this: \$146.64 (hourly rates totaled) x 0.25 = \$36.66; \$146.64 + 36.66 = \$183.30; \$183.30 x 2 = \$366.60. The cost of the weekly meeting multiplied by the 52 weeks in the year mean the annual cost of the weekly meeting works out to \$19,063.20.

Surprised? Drop your station's figures

into this formula and see how much a one hour weekly meeting is costing annually.

## Meeting management

Better meeting management might include:

1. Prepare an agenda for the meeting and distribute it to the participants a day before the meeting. Make sure the purpose of the meeting is clearly stated. If it is a routine weekly meeting, note action items that will be discussed in addition to standard reports.

An agenda of this type will give the participants time to prepare any materials or collect their thoughts on a specific subject. Action items might include items to be completed from previous meetings or upcoming events such as an upcoming promotion and each department's contribution to the event.

2. Limit each participant's discussion time. If each department head gives a standard report, you may want to consider limiting each report/discussion to 5 minutes or less. With six department heads that will take 30 minutes before you begin discussing new items.

Limiting the report presentation/discussion time will reduce lengthy discussions by those who tend to dominate meetings. This will have an equalizing effect and give each participant an opportunity to give feedback and discuss problems. For standard reports, you may want to consider giving each participant a report format to follow that might include: current items, items for the coming week/month, and pending items or problems. By providing a standard report format, you will get more constituent feedback in a more concise format.

## Active management

3. Pro-Actively manage the meetings. If staff members are supposed to complete certain tasks or action steps, discuss the dates that the task/action should be done

with the affected staff member(s). At the end of the meeting summarize the tasks/action steps, responsible person, and the deliverable dates. This will become the action plan.

Write the action plan on a dry ink board or in the meeting minutes to be distributed after the meeting. Set the date and time for the next meeting. Begin the next meeting by asking staff members to give a status report on their deliverable tasks from the action plan.

4. Start the meetings on time. Waiting fifteen minutes for everyone to arrive is unproductive time that costs money. If someone is late, it is their responsibility to catch up after the meeting. It will also send a clear message for the participants to arrive on time for the next meeting.

5. Consider an alternative to the meetings. Most meetings consist of information dissemination and information receipt. Could you distribute some of the information via memo to the department heads or all staff instead of a meeting. It may take an hour for someone to write and type the memo. But that is only one staff hour plus the time for each staff member to read the memo. All totaled, that is less time consuming and less costly than a meeting.

6. Remove all chairs from the conference room? Well, I could certainly understand my friend's logic.

You may consider adding better meeting management to your Management by Objectives list for next year. Think about reducing meeting time by 20 or 25 percent. In my example, a 25 percent reduction in time/cost would be \$4,765. If you can successfully reduce all of your meetings by 25 percent, you could have a considerable savings.

The benefits will be more organized meetings, clearly defined deliverables, and a more productive staff. A more productive staff will produce greater returns in revenue that should exceed the savings of the meetings.

□□□

Sue Jones is a senior manager for Computer Data Systems, Inc., in Rockville, MD. She can be reached at 703-323-9391.



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# Radio Industry Posts Growth in 1993

► continued from page 1

and the local stations are having a strong year.

She said the stations in the Midwest and Texas are doing particularly well. "My sense is that part of the country went into the recession earlier and came out earlier." the stations on the coasts are slower, with Los Angeles being their weakest market and San Francisco doing relatively well, according to Widmann.

CBS Radio also is involved in the national spot business, and Widmann estimated that they have had a 5 to 8 percent growth over 1992. Three advertising areas that she has seen increases in this year are automotive, airlines and mortgage companies.



Widmann

CBS plans to take advantage of the increased profits by channelling them back into promotions which had been cut some during the lean times last year, according to Widmann. She said they are also developing a new format on their FM station in Los Angeles, the ARROW, an oldies rock format that plays primarily music from the 70s. "We're very excited about it. We're putting a considerable amount of money behind it. The good year that we've had has allowed us to make that investment and we will continue to do that, perhaps in other markets, in 1994."

### General improvement

Widmann agreed that the improvement is due to changes in the general economy. "Also I have a sense that clients experimented with other media — i.e., cable — a little bit more in 1992 than we have seen in the past. They may have been disap-

pointed in that. It probably did not fulfill all the promises that they thought it would. So they have come back to radio as a consistent, been-there-forever medium."

Widmann predicted continued growth in 1994 of 2 to 6 percent or slightly more. "We're hedging our bets, based on what the outcome of all this health plan concern might be for corporations and companies and the general public. We're not sure how that's going to work out."

The Heritage Media Radio Group also has enjoyed a good year, according to President Paul Fiddick. He said that Heritage's business was ahead of last year by "high single digit percentages or even low double digit percentages." Heritage Media owns radio stations in seven of the top 50 markets. Fiddick said that radio revenues were up 10 percent generally in those markets during the first six months of 1993.

Fiddick attributes the growth, at least in part, to an improvement in consumer confidence. "Regardless of the politics, I think people saw the Clinton agenda as being one



Fiddick

of a new economic beginning where you had new leadership in Washington that was seriously going to address the economy and domestic issues. I think the average consumer said, 'Yeah, I feel better now. It's less likely that I'm going to lose my job and more likely that I'm going to get a raise next year. I think I'll go out and buy that big-screen TV now.' And as go retail sales, so goes radio."

Fiddick said he anticipates continued growth at a rate that is higher than inflation or the economy, but he does not expect Heritage to change its investment strategies. "We'll continue to do as we've always done. We have always taken the

approach in budgeting that we'd rather budget realistically in revenues and, if anything, undercommit in expenses."

### Merger assets

1993 has been a momentous year for Shamrock Broadcasting, which implemented a merger with Malrite Communications,



Sorenson

making it one of the largest radio groups in the country. Bill Clark, chairman and chief executive officer of Shamrock, said 1993 has been a profitable year.

"We had a very strong year in 1992, so our growth relative to the industry hasn't



Fries

been quite as strong this year, but it's been a good year," he said. Clark said Shamrock plans to continue to expand. "That was one of the reasons we did this particular deal. It gave us a platform for further growth, consolidation through the duopoly rules, if we can find the right properties in the right markets."

Clark believes that the next few years should be good ones for radio. "We think radio's in an excellent position to capitalize on all the things that are going on in the hectic media world right now. Radio is beginning to look more like an island of stability."



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# STATION SERVICES

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## Format Productions Offers "Music Formats" on Demand!

**PORTLAND, Ore.** Many radio markets are having problems competing with the oldies format. The '50s and '60s formats are burning, and programmers are looking for new answers. Format Productions is offering the perfect follow-up, "Oldies, the Next Generation." It covers hundreds of hits that haven't been heard in years.

For information, including demo, contact John Buck at 503-223-4MAT; or circle Reader Service 132.

## Juice up Drive Time With Million-selling Games

**GLEN ROCK, N.J.** Three of America's best-loved board games are now available for radio promotion packages. Golden Games is providing promotional support for the three, million-selling classics, providing generous quantities of each game (valued at approximately \$30 each) in exchange for on-air play and promotion. The lineup includes: Pictionary, Songburst and Outburst.

For information, contact John Sutermeister at 201-444-3844; or circle Reader Service 78.

## Radio Potato Offers New Product

**DALLAS** Radio Potato has added five new buyout products for radio production to its line. "The Spud" is a four-CD collection of :60/:30 production music compiled onto one CD. Categories include "Big Screen," "Media Blitz," "Image" and "Rock/Pop." For morning shows and spots that need identifiable music, "Digital Ditties" offers everything from Wagner's Ride of the Valkyries (remember the helicopter scene from "Apocalypse Now"?) to "Hava Nagilah."

For information or a free CD demo, call Mike Fuller at 800-GOT NUPIS (468-6874); or circle Reader Service 119.

## Sports Byline USA Expands to 8-Hour Format

**SAN FRANCISCO** On Nov. 1, 1993, Sports Byline's programming night expanded from three hours to eight. In association with Platinum Radio Partners II, Sports Byline added three new live hours of sports programming nightly, along with a replay of two of its best hours, creating a unique eight hours of sports talk radio which the company is calling "Sports Overnight."

For information, contact Charles C. Coane at 800-783-7529; or circle Reader Service 213.

## Network Music Introduces Brainstorm

**SAN DIEGO** Created by the award-winning sound designers that gave you ShockWave™, this new package offers over 500 cuts on seven CDs. Brainstorm includes new categories such as Clip Sounds, Atmospheres, Musical Loops, Heat of the Beat and Kickers, as well as Punctuators, Stagers, Glides, Sweeps, Audio Logos, Drones, Sparkles, Zaps, Missiles, Lasers, Jets, Winds and two CDs of rhythm-driven music.

For information, contact Network Music at 800-854-2075; or circle Reader Service 16.

## Music Bakery Releases New CD

**DALLAS** The Music Bakery serves up fresh music of the highest professional quality and features live instruments, real musicians and award-winning compositions for video productions and A/V-multimedia presentations. Subscribers receive a new CD every other month for the one-time buyout price of \$48 each.

Each CD contains a wide variety of musical styles in full lengths (approx. 4 minutes), 60-seconds, 30-seconds and tags. Fourteen CDs are currently available, and a catalog containing a complete description of every cut on every back issue is included with a user's first CD.

The Music Bakery offers a no-risk free trial offer and a 100 percent money-back guarantee on every issue. Users can cancel at any time and still retain their license.

For information, call Jack Waldenmaier at 800-229-0313, or fax 214-414-3160; or circle Reader Service 171.

## Chase's Annual Events Published

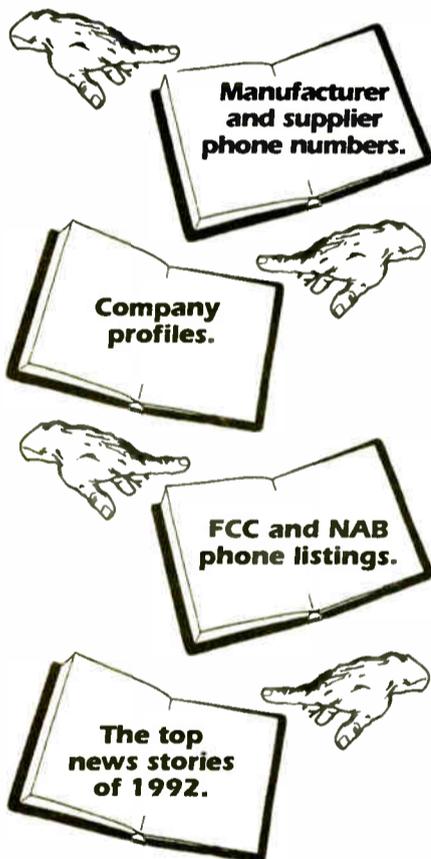
**CHICAGO** The 1994 edition of Chase's Annual Events is available. This 592-page directory contains more than 10,000 chronological entries, thousands of sponsor phone numbers, event indices by name, topic and state and black and white illustrations throughout.

The cost of the book is \$42.95 plus shipping and handling, with a 10 percent discount for purchase of three-to-nine copies and 20 percent off for orders of 10 or more. There is a money-back guarantee for 10 days after receipt. Credit cards and purchase orders are accepted.

For information, call 312-540-4500, or circle Reader Service 137.

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For information, call Dimension at 800-634-0091; or circle Reader Service 165.

## Royalty-Free Classical Music

**SEATTLE** Energetic Music's newest release, "Classical Volume No. 1" has over fifty minutes of royalty-free classical production music recorder for the radio, video and film industries. Great selections from master composers such as Bach, Mozart, Haydn and Grieg are arranged in full lengths along with 60-second, 30-second and stinger versions. One of the highlights on this release is Mozart's Piano Concerto No. 28, which is over 10 minutes in length.

For information, contact Monty Smith at 206-467-7101, or fax 206-467-6931; or circle Reader Service 28.

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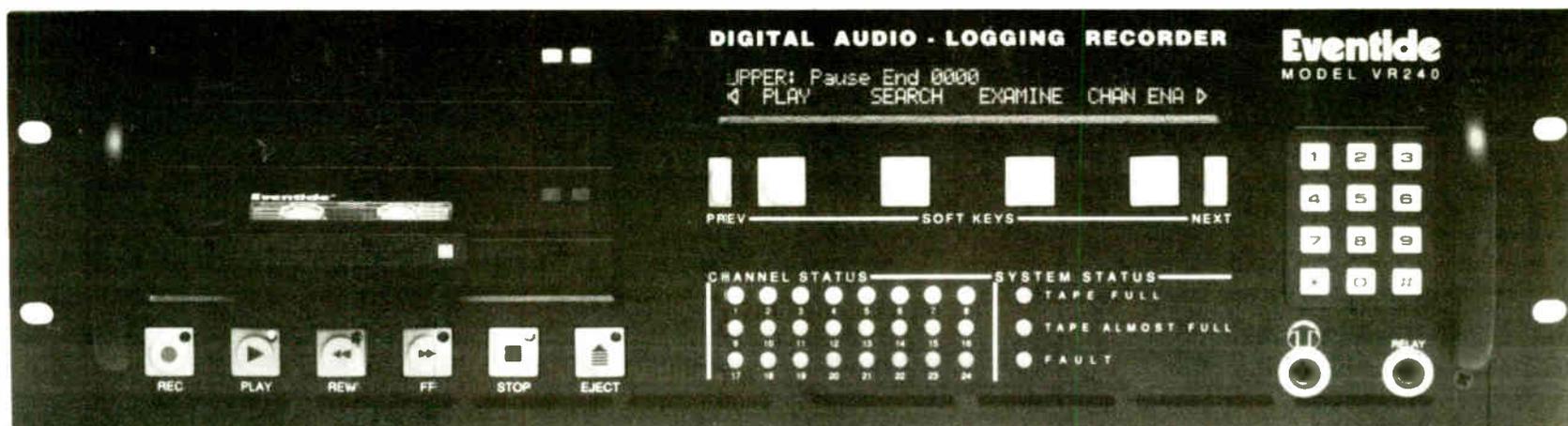
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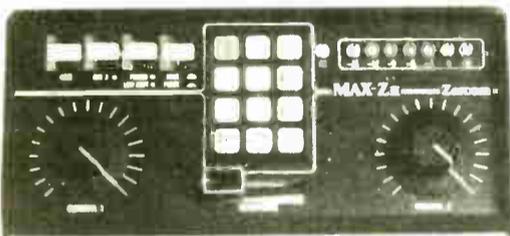
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READER SERVICE NO. 188

# Products Showcased at NAB Radio Show

► continued from page 17

able to the mainstream radio industry.

Noticeably absent from most network rosters is a CHR format. ABC/SMN has the closest thing with its Hot AC. CHR has gone through some tough times of late, but Contemporary Hit Radio can still be a viable option in some cases. Enter Music Channel One.

"America's Contemporary Hit Network" went on the air mid-August and is up to about eight affiliates. Programming is offered at a very reasonable cost and can be utilized as a 24-hour format, nights/overnights or weekends as needed by affiliates. MCO offers one-year contracts, simple startup and no commercial clearance.

I paid a visit to the Kintronic Labs booth. The company provides folded unipole antennas in three- or six-wire configurations, as well as ATUs, phasors for directional antennas, RF relays and a selection of tuning coils and transmitting capacitors.

Equally interesting was the gear available at Loral Microwave-Narda a company that provides broadcasters with RF radiation monitors, drop-in isolators and power/VSWR monitoring, among other things.

## Share in the pie

Select Music offers stations the opportunity to share in the profits of its business, selling music. Listeners call a station's toll-free number and buy any CD or cassette in print at a competitive price.

The listener need only know the name of the song or the time it was played on the station. A station receives a unique listener benefit, a cost-free database, sponsorship, royalties, product clout, and format exclusivity.

The Earth & Sky Radio Series is a two-minute program that deals with Earth science, astronomy, and environmental issues. Each show, distributed on CD or cassette, contains one commercial window.

Are you looking for an overnight programming option? You might want to check out Date-Net and Radio-Date. The program allows a station to create revenue opportunities without even selling a spot by utilizing 800 and 900 phone lines. Date-Net is a call-in talk show which utilizes a computer system to match listeners with local singles.

Radio-Date directs listeners to your station to call an 800 phone number, punch in a code that ID's them as your listeners and then pays you for every call.

Accu-Weather showcased its complete weather forecasting and graphics service, FirstWarn™ equipment, WeatherShow™ product including audio and video for complete customized weathercasts in any language.

If you're in the market for satellite equipment, changing networks, etc...you might want to give Cristy Lowery a call at Satellite Systems. These folks do a great job of refurbishing or upgrading satellite equipment. They come highly recommended by our friends at Unistar and provide a much needed service to our segment of the industry.

## Voice overs

There are a zillion places to go for voice overs. I like to find out who's new or relatively new, as the case may be, and see what they have to offer. A couple of folks you might want to check out are Steve Herrerger at Profile Communications, and Rick Hull. Both have a great set of pipes,

reasonable rates and do good work.

There's a new application of fax technology that is making some headway in business circles called Fax on Demand. Basically you call on your fax machine, run through a menu of available information, select what information you want by touchtone and it is automatically sent to your fax machine. Application for radio: immediate, hassle free sales and advertising rates and information for clients/potential clients. Playlists, programming and promotional information, contest rules, the list could go on.

A couple of cost efficient, great sounding production CDs I ran across: PromoPack from Thompson Creative has

over 200 workparts ranging from music beds to sweeps and sounders. GMI has the Lazer Toolkit that's loaded with useable workparts.

Promising to "suck up to any GM to make a sale," Radio Potato offers a "menu" of production services ranging from The Common Tater (no kidding, that's what they call it), a full-service production package, to The Spud production library.

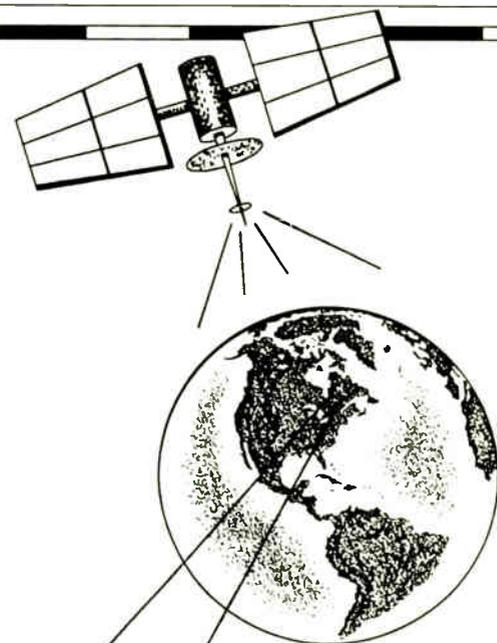
So I'm walking off the exhibit floor and this guy comes up to me and says, "Nice tie." The next thing I know I have a cassette brochure in my hand and am being pitched on a new program. I had been "Leased," which, as it turns out, just about everyone at the show got the same treat-

ment. The guy, Tony Lease. The show, Travel Secrets with Tony Lease, an infomercial that talks about every aspect of travel and "opens the door to new clients" because he offers free international trips to your listeners.

If you're looking for sports, event, concert or trip promotions of any kind, call RPMC Travel & Entertainment Promotions Worldwide. RPMC offers everything from Monday Night Football trips, New Year's Eve at Times Square, a getaway to your own private 125-acre tropical island, Space Camp trips, you name it, they can send you or your listeners there.

And if you are in the market for a completely customized and outfitted promotional vehicle (bus), contact San Diego-based ExecuCoach. The company had one of its buses parked outside the convention center, and it was a beaut.

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## SBE Gathers Its Fold in South Florida

by Gordon Govier

**MIAMI BEACH, Fla.** Digital is the wave of the future or, more accurately, the way to the future. The what of the future is choices, many more choices than today.

The recurring theme of the Society of Broadcast Engineers and Radio Television News Directors Association joint convention in Miami Beach, held Sept. 29-Oct. 2, was that the broadcast news product is becoming just a small part of a rapidly increasing number of electronic media alternatives.

### New approaches needed

NPR News Anchor Dale Williman, a panelist in a session titled "'90s Ways to do the News," observed that television is heading towards the segmentation that's already occurring in radio. "A lot of the FMs have gotten out of the business and won't come back to doing radio news because they don't see it as cost effective. I think it's going to be abandoned, especially on the FM side, to public stations to do something long-form."

"People are going to be able to choose what kind of news, what kind of other programming they want, where to go, when to get it," predicted Phelps Hawkins, senior vice president and director of news and special events for American Public Radio. "I think it is a sleepy radio industry that will let this opportunity get past them. We're trying to assess the real appeal of programs, and affinity between programs on the part of listeners; to look where those affinities might pop up most frequently and most beneficially."

Hawkins says the chance to choose is bringing a new age of thinking about programming. Even though long-form, highly textured programming is a hallmark of

public radio, he would like to see more effective use of live radio. "I know people don't like that because we're all so nicely controlled, but that's a primary advantage of radio. We need to play to our strengths."

News and information is unquestionably one of the strengths of radio. Panelists observed radio news listening increased during the Persian Gulf War and stayed high. In part that may be because people now have fewer places to turn for radio news, but it's clear people still choose news.

### Technology's role

The more technology added to the workplace, for handling news on demand and other new formats, the more flexible the radio journalist must be, able to edit tape in a variety of formats and now also computer literate.

But ultimately it all boils down to writing. And panelists worried that the small stations that have traditionally been a journalistic training ground have cut back their newscasts and are now using satellite services.

There were two complaints from panelists about that other training ground, journalism school. One is that their products too often seem to be inadequately prepared for entry-level work. The other is that most broadcasting students choose television over radio. "There are a lot of freedoms you get in radio that you don't get in television," said CBS radio executive producer Robert Garcia. "We're not communicating that to students."

Radio news also has its frustrations, Garcia admitted: "I can name a dozen network level correspondents who have told me they would love to be able to do an NPR-style story, to do a four minute or five minute piece on something.

But, I've never heard a public radio reporter tell me that they'd love to do a 30-second report on something."

### Some believers remain

There are still some commercial FM stations with strong news departments. One of them, Chicago's WXRT, was represented on the panel by news director Neil Parker.

The readily acknowledged key to success is a sales department that knows how to sell

newscasts. An even better key, in this environment of new options and choices, is a sales department that knows how to sell news.

During a roundtable session titled "Radio News & Talk on The Cheap," the story was told of an Indiana radio station that faxes a daily news roundup to a local printer. The printer adds a border of advertisements and then runs off enough copies for the local McDonalds to use as tray liners for the rest of the day.

A handful of radio stations are utilizing opportunities provided by cable, such as filling the window for local news on the CNN channel. Other radio stations have

continued on page 30 ►

## Equipment and Software Pros Exhibit Wares at NewsTech '93

by Lucia Cobo

**MIAMI BEACH, Fla.** Attendance at the Society of Broadcast Engineers convention held here Sept. 29-Oct. 2 was up slightly from 1992's gathering in San Jose, Calif. Registered attendees in 1992 numbered 250, this year slightly more than 300.

Companies attending the exhibition, held in conjunction with the Radio-Television News Directors Association convention, were pleased and somewhat surprised at the quality of traffic. Although most equipment manufacturers and distributors were notably absent, the stalwarts that did attend reaped the advantages of a slower pace of doing business.

Transmission and related gear was available from several manufacturers. CCA Electronics displayed its new high-performance 60-watt FM broadcast exciter. The FM60G is a synthesized, FM broadcast exciter for operation in the 88-108 MHz band. The operating frequency can be set

in, in 25- or 50- kHz increments, to any channel within that band. The output power is continuously variable from 5 to 60 watts.

Broadcast Electronics showcased its AM1, solid state 1 kW transmitter with C-QUAM™ stereo built in at no extra cost. The unit features high-efficiency Class E operated power modules and a switching power supply provide for low power consumption and cool operation. The unit uses a "star" combiner network for uninterrupted operation with minimal power reduction without the use of dummy modules.

Rohde & Schwarz displayed its new Super Compact Radio Data codec DMC 01. The unit meets the U.S. RBDS standard as well as CENELEC EN 50067. Various paging systems can be implemented by software uploads, including: TNPP telocator Protocol, EBU Universal Protocol, WARI and EWS. The DMC01 optional decoder function enables rebroadcasting. David Alwadish shared booth space with Rohde & Schwarz, and displayed information about his CouponRadio.

Browning Labs was on hand to display its line of VHF, UHF and FM transmitters. The transmitters are all solid state design ranging from 2 watts to 5 kW.

### Surges and lines

Harris Allied displayed information about its fixed and mobile video and satellite communications systems. The company displayed information on its line of radio and television transmission equipment, including the new FM DIGIT™ digital exciter, as well as its catalog of more than 10,000 radio studio products from more than 350 manufacturers.

EEV Inc. was on hand to showcase its power tetrodes for AM/FM transmitters with enhanced mesh filament for longer life and reduced noise. Best Power Technology exhibited its Power Partner line of power protection devices.

Andrew Corp. introduced the HRLine transmission line, which combines the benefits of conventional rigid lines and corrugated cables (available in 50- or 75-ohm type).

Superior Electric displayed its line of Stabiline voltage conditioning equipment, including voltage regulators, power conditioners, and uninterruptible power supplies.

JAMPRO Antennas displayed information about its FM and TV broadcast antenna systems. The company builds low,

continued on page 29 ►

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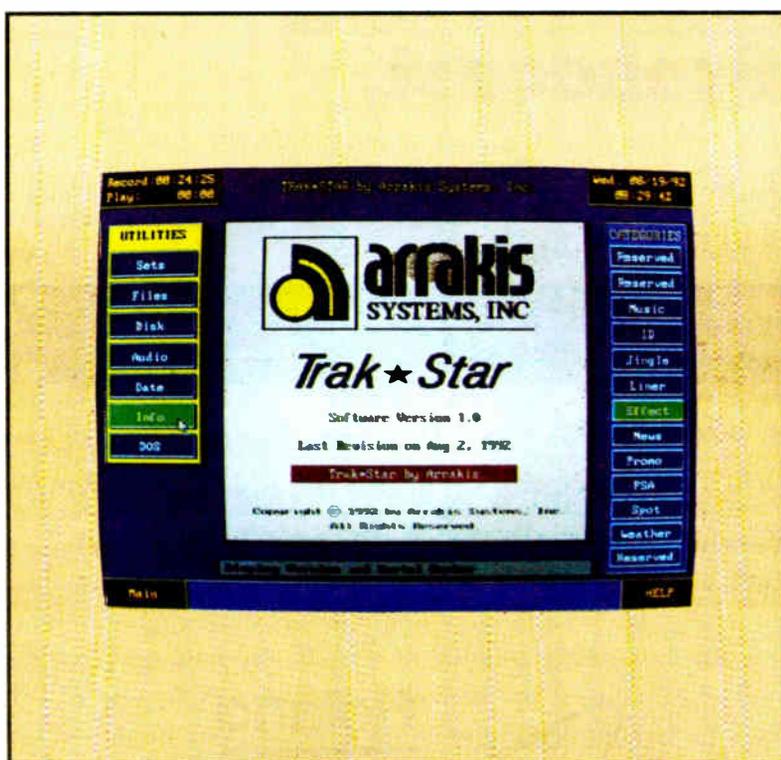
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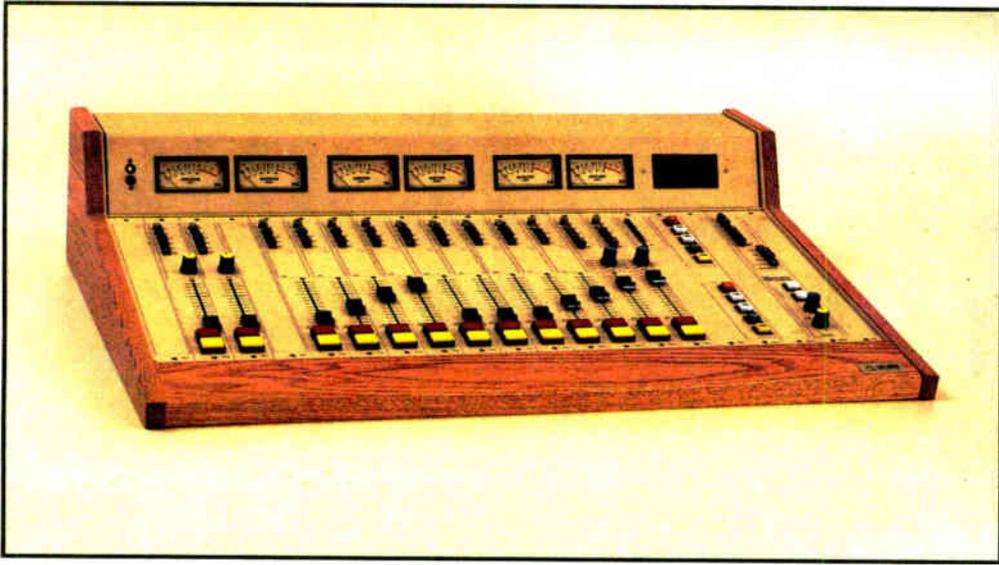
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The 12,000 is the #1 selling Arrakis console line from the #1 console manufacturer. With three stereo output buses and two mix-minus buses for telephone interface, the 12,000 can fill any application. The 12,000 also supports a control room and two studios standard. Panning or Mode select are available on the four models of input modules, VCA control of audio delivers reliability and performance.

Quality, performance, and durability make Arrakis consoles the leader around the world.



Deluxe thru-table mainframe displayed below

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**Arrakis Systems is a world leader in radio studio technology. In Japan, Digilink is a brand name for hard disk audio for radio. For use around the world, the United States Air Force chose the 10,000 series console from among all competitors as its console of choice. When the United Nations needed 6 entire studios with consoles and furniture for a rush shipment to Cambodia early this year, they chose Arrakis 10,000 consoles and Modulux furniture. In Jamaica, Tahiti, and elsewhere, entire factory assembled and tested Arrakis studios are on the air. Around the world and of course in the United States...more stations buy Arrakis for their digital audio, console, and furniture needs!!!!**

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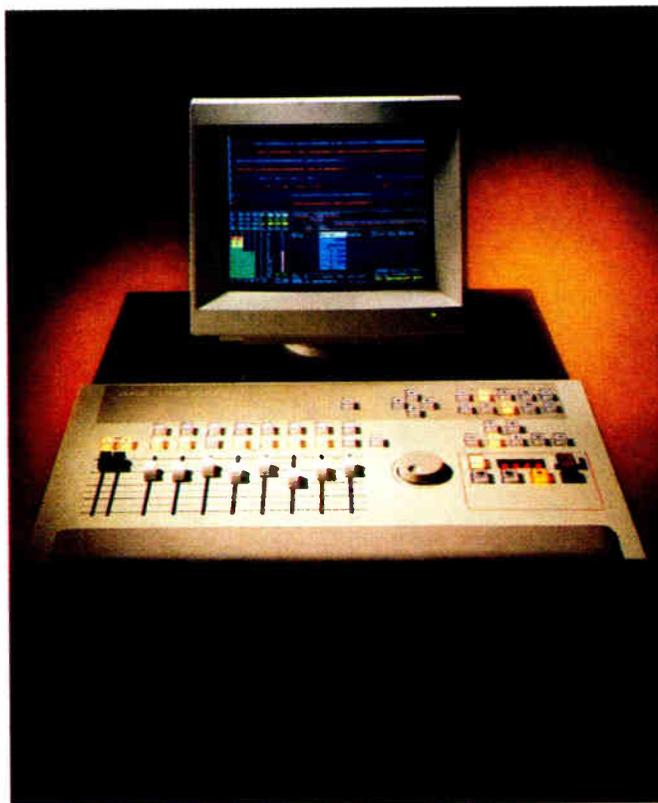
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about a company with over 40 years experience manufacturing professional audio products, who was already shipping a digital sound editor for radio production. Not coincidentally, this system had many of the same controls and functions they were used to.

They tried a demo of the DSE 7000 and realized they could produce spots in one-third the time. Which meant they had time for a certain luxury called creativity. The DSE's UNDO button gave them room to experiment. And its audio quality raised their standards to an entirely new level.

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# CBS's Rather Admonishes the Press

by Gordon Govier

**MIAMI BEACH, Fla.** CBS News anchor Dan Rather's speech on the opening night of the RTNDA convention elicited extra attention as Rather called

on broadcast journalists for more courage to stand up to the ratings monster.

"We need a few good men and women with the courage of their convictions," he said.

"Broadcast executives and owners are decent people," Rather said. "But you'd

never know it from the things that fear makes them do—from the things that fear makes them make us do."

Having just participated in the unveiling of an Edward R. Murrow commemorative stamp, Rather referred frequently to the broadcast news legend, including his famous speech to a 1958 RTNDA convention. The most quoted line from that speech was one about "wires and lights in a box." Rather suggested that Murrow's description of "this weapon of television" was the more important line in that speech.

"In too many important ways we have allowed this great instrument, this resource, this weapon for good, to be

squandered and cheapened," Rather said.

The theme of the moral responsibilities of broadcasters surfaced several times during the convention: during a freewheeling discussion of the impact and credibility of tabloid style news programs; during a town hall meeting on sex, age and race in the newsroom; during a speech by ABC News correspondent Catharine Crier, and during the Paul White Award address by former CBS News editor Ed Bliss.

Bliss, after being introduced and lauded by Walter Cronkite, resisted the temptation to reminiscence at length about his work with Murrow and Cronkite.

"Care about what you write," he admonished. "It's not enough to care about style, care about the people in your story. Good journalism is good for the country."

## RTNDA and SBE NewsTech

► continued from page 24

medium, and high power antennas, and specializes in multistation systems.

**Holiday Industries** has designed a new induced current meter. The unit standard features include: frequency response 3 kHz to 100 MHz; 60 dB dynamic range (1 to 1000 milliamperes); direct reading analog meter; NiCad rechargeable battery, and optional fiber-optic remote readout.

**Fidelipac** displayed its brand new sample rate converter, the Dynamax SRC. The unit is microprocessor-controlled and receives stereo digital audio signals conforming to AES/EBU, IEC 958, S/PDIF or optical in professional or consumer mode at any frequency, and outputs it at either a user-programmable sampling rate, or synchronized to a second, reference digital audio signal. The unit list price is \$1,290 and is available for shipment.

### Newsgathering news

**NPR Satellite Services** showcased its range of interconnection services to radio broadcasters, including Single Channel Per Carrier (SCPC) audio transmission, fixed and transportable uplinking, digital fiber optic channels and service to Galaxy and Satcom.

Also in the data delivery business is

**Colby Systems Corp.** The company displayed its newsgathering system for sending live motion video and audio through any telephone or cellular system.

**GTE Spacenet** displayed information about its satellite newsgathering service, News Express™. News Express offers line, on-the-spot coverage and news exchanges with other stations. Satellite time is available in increments as brief as five minutes.

Information providers also lined the aisles of the NewsTech '93 Exhibit Hall. Included in the line-up were **Associated Press (AP)**, **StandardNews**, **NASDAQ**, and **Accu-Weather Inc.**

AP's booth included a variety of products, including its AP Newscenter—a newsroom computer system designed for ease of use and future expandability. AP also showcased its news wires and AP Audio Services.

Accu-Weather showcased its complete weather forecasting and graphics service, FirstWarn™ equipment, WeatherShow™ product including audio and video for complete customized weathercasts in any language.

StandardNews exhibited information on its 24-hour full service audio news network. The company also displayed information about its recently acquired, fax-based news service, Zapnews.



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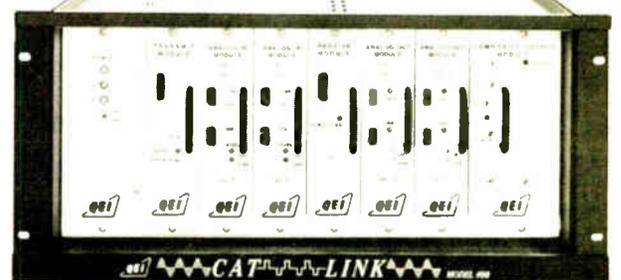
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## PROMO POWER

# Learning to Boast for Success and More Money

by Mark Lapidus

**WASHINGTON** You read my article last month on generating press and now your station's been on the cover of your local paper, Time, Newsweek, and on the NBC Nightly News. The general manager is very excited about all of this coverage and suddenly realizes that there may be a benefit in letting your clients know about the attention you've been receiving. Your GM has just opened the door to our next topic...Marketing to your clients.

special publication. Most of the space should be filled with photographs of station events and clients. Using these photos, captions and short articles, your goal is to give clients as many reasons as you can to buy your station.

If you've got a new television spot running and your ratings are great, brag about it. Feature a photograph of a highlight from the TV spot. The caption could read "W—'s new television spot is working! Thanks to this heavy campaign we're No. 1 men 25-49, Monday-Sunday, 6 a.m. to midnight." Salute as many advertisers as you can by name.

Ask a trivia question like "What's the largest demo cell in the Metro Survey Area?" The first fifty people to call their rep with the correct answer win station t-shirts. Although the photos in your newsletter don't have to be in color, it is important to use splashy color in graphics and headlines.

People are used to seeing bright slick publications and although a black and white newsletter is much cheaper, it shows when you take that route. Budget around two thousand dollars for producing a thousand copies of a four page (front and back) three color mailer. Budget more for other colors and postage.

Put your station on video twice a year! Start by buying or trading for a home video camera. You can buy a decent Sony 8 with ten zoom and low lux for around \$800. Videotape all of your station remotes, appearances and guest stars that come to your studios.

Save all copies of any news coverage your station receives on television and gather your most recent TV commercials. Take the best of this material and create a video newsletter.

Keep your video-newsletter under five minutes in length. Make sure the pacing is fast. The editing can be done with two regular VHS machines, but to do the best job,

you should rent three or four hours in a video editing suite. You don't need broadcast quality, so a video company that does industrial work is your best bet because it'll be cheaper and the company will understand what you're attempting to create.

You'll save a lot of time and money by reviewing all of your video in advance of editing. Make detailed notes about what you'll be using and how you can easily locate the footage. Instead of using the raw sound from your video, overlay a narration done by one of your disc jockeys or someone in management.

It's a good idea to have your sales manager and general manager be part of the entire process. They will be more in tune with what your clients may find interesting and what your salespeople will be most pumped about showing. When the project

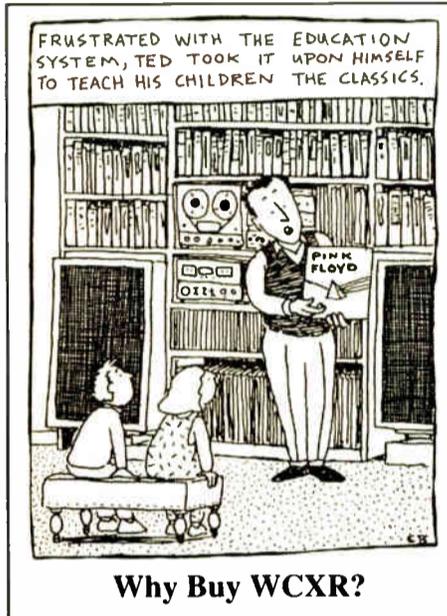
is finished, have a number of VHS dubs made. It's also a good idea to invest in a small TV set/playback unit that your salespeople can take along on calls. There are several systems small enough to put on a client's desk.

**Postcards:** You feel good when you get one in your mailbox at home. They usually come from friends on vacation in exotic locations. They're rarely used for business purposes, so they get noticed at the office.

Hire an artist who can conceptualize a drawing of something funny about your station or format that will fit on the front of your postcard.

The other side of the card has the usual room for an address and one reason why an advertiser should buy your station. These can be mailed cheaply once a month.

continued on page 32 ▶



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Postcards are a great way to keep your station top-of-mind with your clients.

Staying top of mind with your advertisers is a year-round project that should be carefully conceived rather than haphazardly planned from month to month. Now is a perfect time to develop your 1994 client calendar.

**Newsletters:** This is a terrific quarterly project. Doing four client newsletters per year allows enough time to produce a really

## RTNDA, SBE NewsTech '93 Convention Held In Florida

▶ continued from page 24

departments, sometimes going as far as computer links between their assignment desks.

Cross promotional benefits were perceived from such arrangements, particularly when radio reporters beat TV reporters to news events and were patched in to the TV news anchor to report via cellular phone.

The cellular phone, though, may soon become even more potent as a news gathering tool for television. Several companies on the exhibit floor were marketing technology to send video pictures via cellular phone. In the exhibit hall the new StandardNews Network, fresh from its acquisition of Zapnews, was aggressively seeking radio clients.

Reuters was also on the floor, with another broadcast wire alternative. The

Associated Press was there, of course. United Press International, fresh off its own recent restructuring, invited clients and potential clients to its hospitality suite.

In terms of electronics and audio tape products, there was once again very little for a radio news director to look at, despite the joint convention arrangement with SBE.

Next year will be different, say radio partisans within RTNDA leadership. The 1994 convention will be held in Los Angeles, in conjunction not only with SBE but also SMPTE and the NAB Radio convention. In another good sign RTNDA members elected a radio veteran, Bill Yeager of Metro Traffic, to take over as Chairman at the 1994 convention.

A seminar reserved for radio technical talk was devoted primarily to a presentation of a new CBS digital editing unit designed specifically for news use. The presentation by Tony Masiello and Bernard Gershon, of CBS Radio, showed a PC-based, icon-driven tape editor designed to emulate analog equipment. The \$25,000 cost was compared with approximately \$75,000 for an editing room that would do the same job.

Masiello briefly discussed Inmarsat, a briefcase sized portable satellite terminal (another \$25,000 investment). He also mentioned that CBS has evaluated the mini disc and other digital formats for news gathering and likes the potential of the Digital Compact Cassette. They and others are now trying to convince a cassette manufacturer to produce a portable DCC recorder.

One of the best sessions was a voice clinic with sound advice from Carol Dearing, Lillian Rae Dunlap, Eve Pruden and Ann Utterback. All four women have extensive experience in helping news broadcasters and aspiring broadcasters use their vocal equipment properly and effectively. A tip from Pruden, slow down. "You can talk much more quickly than I can hear you," she said.

□ □ □

Gordon Govier is news director of WNBC(FM) Madison, Wis. and editor of Scribe, a newsletter aimed at news people in religious broadcasting. He can be contacted at 5606 Medical Circle, Madison, WI 53719; 608-271-1025.

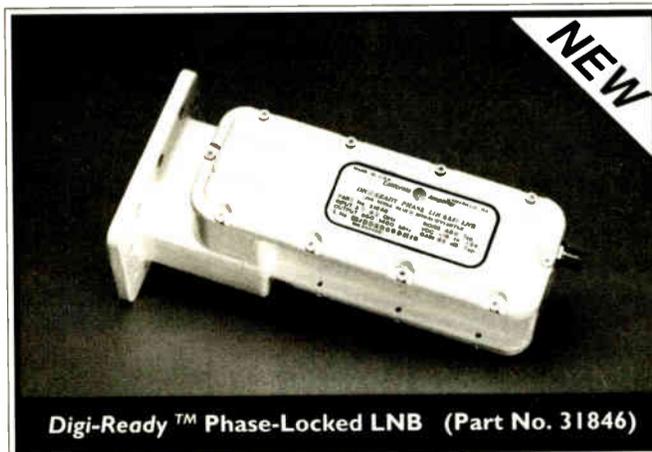
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World Radio History

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**AUDIO  
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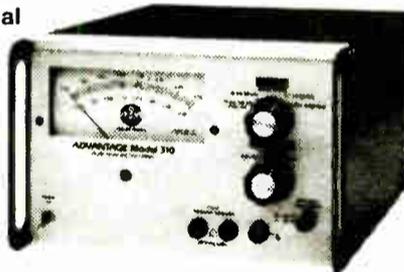
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► continued from page 30

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□ □ □

*Mark Lapidus is promotion director for WCPT(AM)-WCXR(FM) Washington. He can be reached at 510 King Street, Alexandria, VA 22314.*

# Westwood One Broadcasts U2's Zoo TV From Dublin

► continued from page 15

problems, so we think ahead and have backups for everything," Stephan said.

## Parking

Parking is another element of the "3 Ps" equation Stephan defined. It is always best to get as close as possible to the source, he said. The Westwood One mobile unit was parked in a security area about 600 feet behind the U2 stage and about 50 feet from the BBC truck and the U2 power trucks. The cable runs were about 550 feet, according to Stephan. "With U2, we pretty much got what we needed," concerning the parking.

And how was working with the U2 management and the band themselves? "They have been tremendous," Stephan said. Thom Ferro, Westwood One's Radio executive vice president/general manager, echoed Stephan's thoughts on U2 and its management. "They are very professional, very well organized, first rate people," he said.

Stephan's role as producer of the event was focused completely on the technical aspects of producing the broadcast. "The show was broken into two parts," he said. Stephan's role was producer/technical director. His counterpart was producer/creative director Andy Denmark, based in New York. "I focus completely on the technical issues, while Andy focuses on what the show is going to be," Stephan said.

The broadcast was mixed with special pre-recorded interviews as well as commercials and live microphones into the crowd before the concert started. Once it started, however, there were no break-ins to commercials. The commentary before and during the show was presented by Mal Reding, Westwood One's European music correspondent based in London; along with Dia Stein of WXRK in New York and also a producer for The Source, on which she hosts the Rock Report for the Westwood One network show; and Dave Fanning of R.T.E.

One of the pre-concert interviews was with Carter Allen, the WBCN-FM Boston disk jockey who is said to be the first American to play U2's music on the air back in the early 1980s. That is not so important, except that the interview was held in Verona, Italy, where Allen and his equipment were flown in. The tapes then were jetted back to the Westwood One's Culver City, Calif., studios and turned around for a special produced in New York. That interview hit radio stations earlier in August.

Americans attending the concert were amazed at the strategy—or lack thereof—behind seating. The floor of the outdoor arena was all standing general admission, meaning people near the front risked being crushed by the crowd behind them. Security guards pulled people over the fences as they were fainting from dehydration or requesting to be taken away from the mayhem. As people would fall, it was a human domino effect, ending with hundreds of people on the ground, picking themselves up to get right back into the concert.

## More live events

Safely behind the scenes, Stephan admitted the staff at Westwood One likes to do these live events. "I have a blast," he said.

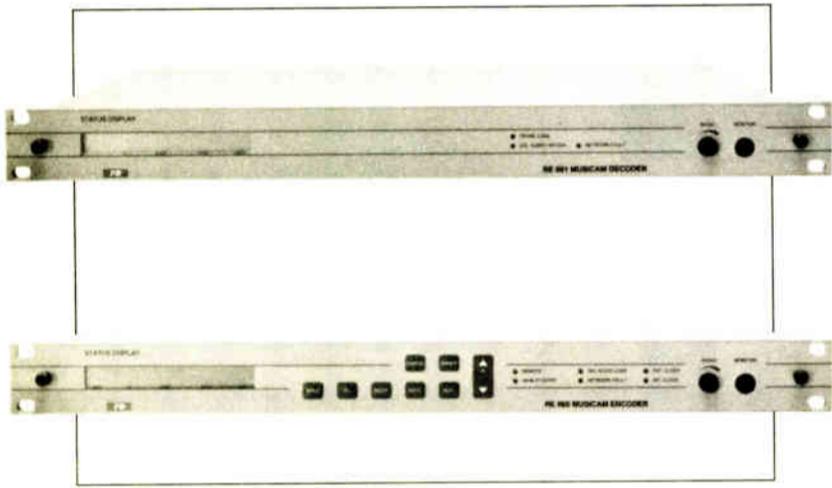
"It's exciting for the company to do, plus the radio stations get excited and the artists tend to get excited about it," Ferro said. "It's just exciting from all points of view."

Other shows recently completed or upcoming for Westwood One include Aerosmith Live From Brussels (on Halloween); Tom Petty Live Nov. 4 from Gainesville, Fla. (another homecoming event for an artist); and on Nov. 26, Rod Stewart Live from Houston.

□ □ □

*Annette Deutscher, a former journalist, is RW's marketing assistant, and an unabashed U2 follower. Her trip to Dublin marked the seventh time she has seen the band perform.*

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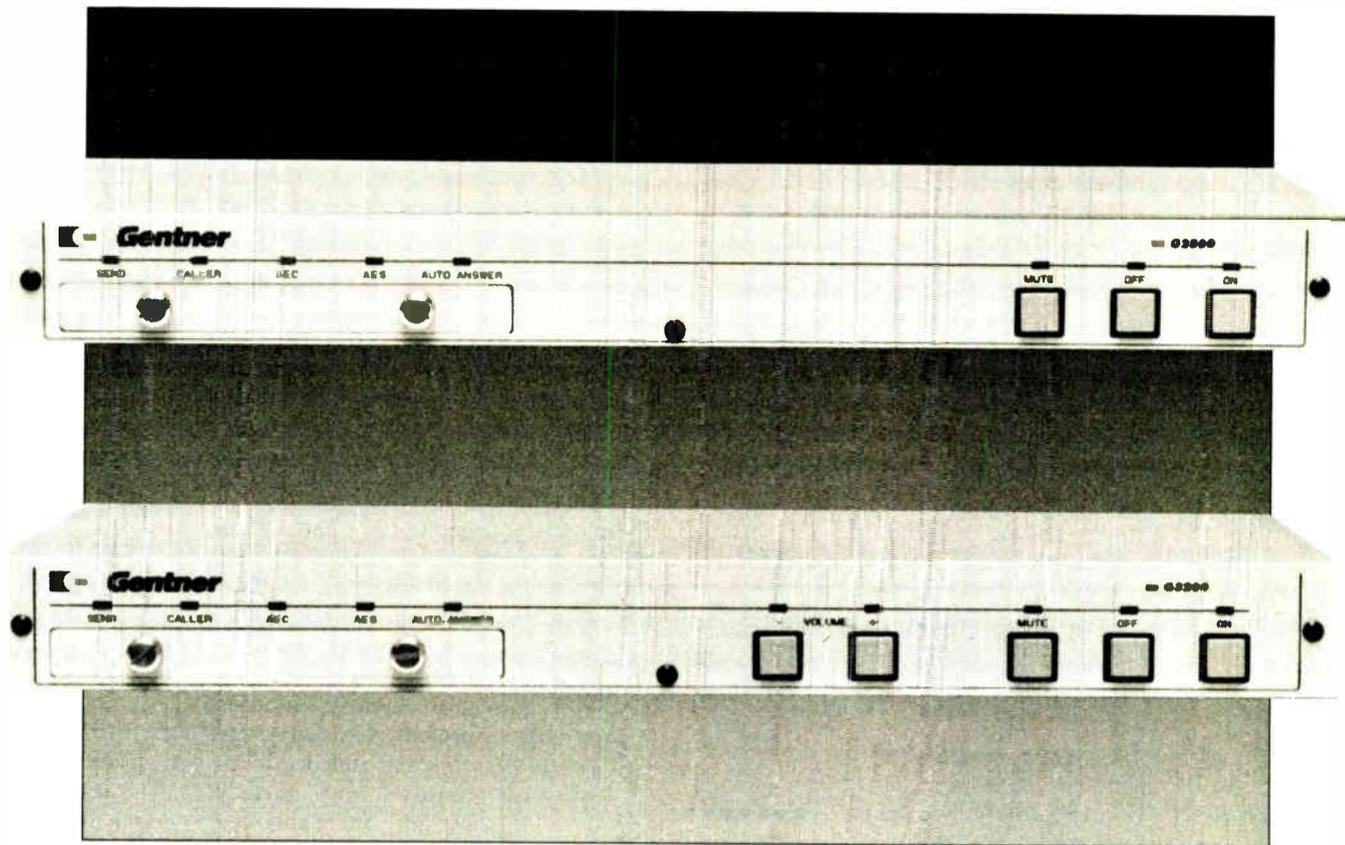
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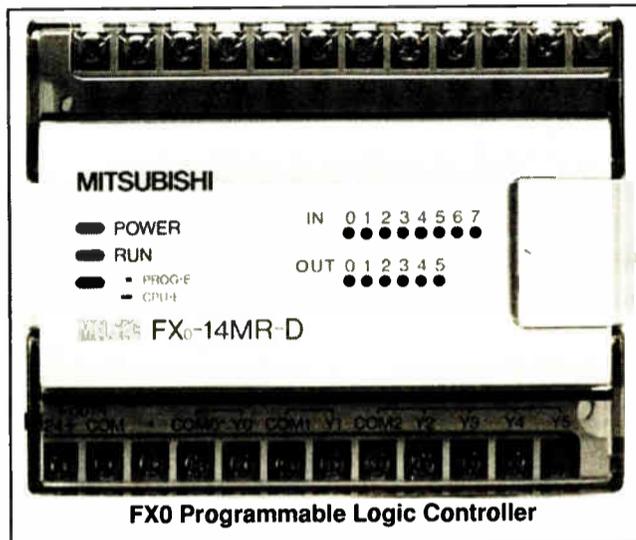
# Going Over Details of PLC Setup

by Richard Mertz

**WASHINGTON** In my last column, I broached the idea of using a PLC to control the operation of a motorized coaxial switch. Before you start drilling rack panels, mounting buttons, and relays, it's a good idea to set up the components on the bench. This will insure that all the pieces of the puzzle fit together and operate properly.

### Get an idea

To get an idea of what a PLC looks like, see the photo on this page. While this is not the configuration I am using for this project, it gives you a feel for the



look of the gear. Note that the unit pictured has terminals for a 24-volt input. Some units are configured this way.

You will be using an AC-powered base unit with an input voltage of 100 to 240 volts AC. You read right. The base unit accepts this wide range of input voltages. This makes it easy to install a PLC anywhere. When I recently built a coaxial controller, much like the project described here, I used a Corcom RFI filter/power entry module to connect the PLC to the AC line. In most cases this is

not needed for a PLC.

PLCs are designed to operate in "electrically polluted" environments. In my case, the Corcom power entry module was an easy way to mount the fuse and AC line cord connector. For the purpose of this conceptual project, a simple line cord and fuse, properly insulated, will suffice.

Figure 1 is a block diagram of the internal workings of a PLC. The unit used for this project has 12 isolated inputs, a microcontroller, eeprom memory, battery backup for the microcontroller, and 12 "a" style relay contact outputs.

The battery protects only part of the internal microcontroller's memory, thus enabling the PLC to pick up where it left off after a power failure or interruption. The program memory for this project is saved in the eeprom and does not require any battery backup. There are other types of program memory storage options such as RAM and eeprom.

### Direct-connect

The inputs to the PLC are optically isolated and designed to be directly connected to switches, push-buttons,

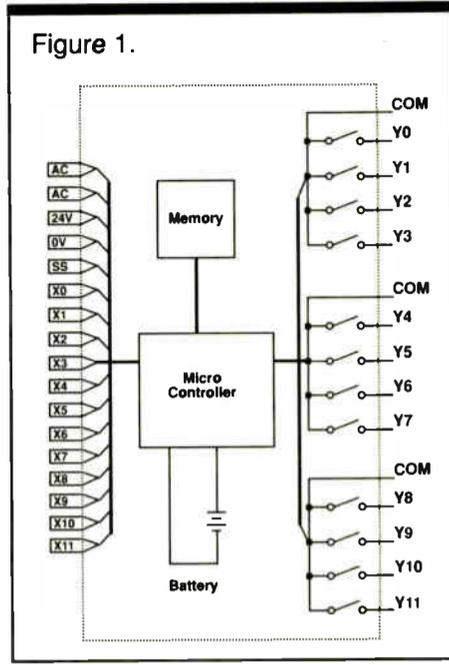
and relay contacts. You can either use a source of 24 volts or sink the input to ground (0 volts) to activate an input.

Figure 2 shows an equivalent circuit of the PLC's inputs when the S/S (source/sink) terminal is connected to the 0 volts terminal. The voltage drop across the internal components when a particular input's terminal is connected to 24 volts lights the appropriate LED in the optical isolator telling the microcontroller that this particular input has been activated.

Conversely, if the S/S terminal is connected to 24 volts, then a ground to any input tells the microcontroller that the input has been activated. The bipolar optical isolators make it easy for this device to offer this feature. By the way, you can tell if the input has been correctly activated. There are LEDs built into the PLC that light when the corresponding input has been properly activated.

Moving on to Fig. 3, here is the proposed system wiring. Note that there are relay contacts operating other relays. This is necessary since the relays internal to the PLC are too small to handle the current requirement for the switch directly. The coaxial switch I used was the Delta 6740 switch. Clip your Amprobe around one of the AC leads to the coax switch and you'll find you need close to 4.5 amps capability. The relays I used have 10 amp contacts.

Also note the wiring of the AC through the relay contact. The circuit is set so that only one relay at a time can activate the coax switch. With both relays open nothing happens. With this configuration, a failure of the PLC will not cause

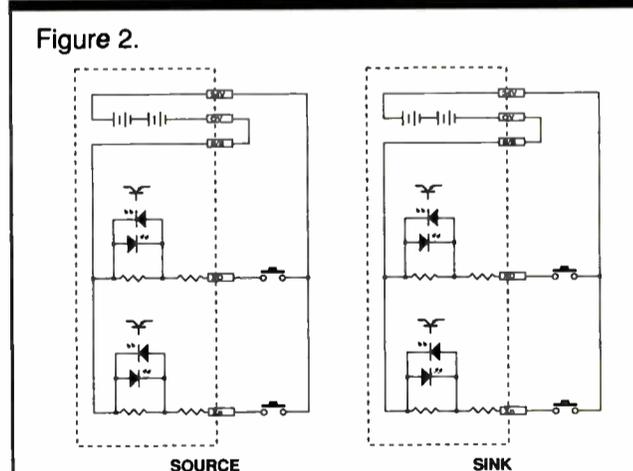


the coax switch to move. The output relays are connected in three groups of four contacts each with a common connection. The first group switches 0 volts to devices like the external relays or indicator lights.

The next group provides control to transmitter No. 1, and the next to transmitter No. 2. We have made the assumption that both transmitters have 15 to 28 volt DC control ladders that require momentary closures for activation. If your transmitter has a different control scheme, you will have to adapt it for low-voltage operation. We only need to control the plates on and off for both transmitters. You must wire the transmitter interlocks through the interlocks within the coaxial switch itself.

### Push-button provision

On the input side, I have provided for two push-buttons. "Main transmitter" on the air and "auxiliary transmitter" on the



air. Each button provides ground to the respective inputs when pressed. The Delta coaxial switch provides a 120-volt AC output to turn on tally lights. We have connected this 120-volt AC tally voltage to 120-volt AC relays. The contacts provide a ground closure, just like the push-buttons, telling the internal microcontroller when the coaxial switch has stopped and which position it is in.

There are also solid state interface devices that can be used to convert the 120 tally voltage to a saturated transistor output. For now, we will stick with the relays.

You can connect the momentary con-

continued on page 41

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## INSIGHT ON RULES

# Broadcasters to Face Speech Issues

by Harold Hallikainen

**SAN LUIS OBISPO, Calif.** I'm going to take a short detour from my normal path of trying to help you keep the local FCC inspector happy. I'd like to share my thoughts on what I see as the road down which broadcasting might be heading. I'm looking to provoke some discussion on the future of broadcasting.

**The First Amendment**

I see the First Amendment's provisions for freedom of religion, speech and the press as an expanding sphere of freedoms: freedom of thought; freedom to express that thought, and the usage of available technology to further express that thought. At the time of the writing of the Constitution, the printed word was the only mass communications medium available and the Constitution was written to not restrict that means.

As additional forms of mass communication have been introduced, some have argued that these new vehicles need governmental control (content regulation) because of their powerful influence, the "scarcity of voices," or because of the use of a public resource (the electromagnetic spectrum).

The "powerful influence" argument

justifying governmental regulation of content didn't seem to be a strong enough argument for the framers of the Constitution to put content control on the print media.

Although a free press may be dangerous, it is necessary for a free society. It appears the same argument could be used to support the government staying out of broadcast content regulation, the current "powerful medium."

The second argument in favor of broadcast content regulation is that there are only so many broadcast channels to go around. We can get a rough idea of the relative scarcity of the various media by checking the yellow pages of the phone book.

Here, in San Luis Obispo County, about 22 radio stations are listed. Six television stations are listed. For those subscribing to cable, probably another 30 to 40 signals are available. Without cable, perhaps 28 "voices" are available. Checking under newspapers, we find about the same number (28) publishers.

Is there more "scarcity" of voices in the electronic media than in the print media? If there were, would that justify overriding the First Amendment?

The third argument in favor of government content regulation (use of a public resource) seems to have some

merit. The lowest unit rate rules seem to be an attempt at getting broadcasters to pay the public for use of the spectrum.

It does seem, however, that a much more direct solution to this problem is available. That solution would be for broadcasters to pay for use of the spectrum. Perhaps if such payment were made, there would be no strong argument in favor of content regulation (whether through lowest unit rate, fairness doctrine, or whatever).

**Spectrum leasing**

Broadcasters are typically buying spectrum, as it currently stands. If they buy an existing station, they pay the previous licensee for the channel. If they apply for a new channel, they end up paying substantial legal fees and buying out other applicants in an effort to show they are the most qualified applicant.

Another approach would be to offer a fixed term lease on a channel (perhaps 20 years). These leases would then be auctioned. At the end of the lease term, the current leaseholder would be welcome to put a bid in again for the channel. A leaseholder could also sell the unused term of a lease to another wishing to get into broadcasting. Existing antitrust laws and FCC ownership rules

could be applied to keep one broadcaster from taking over all the stations in one market.

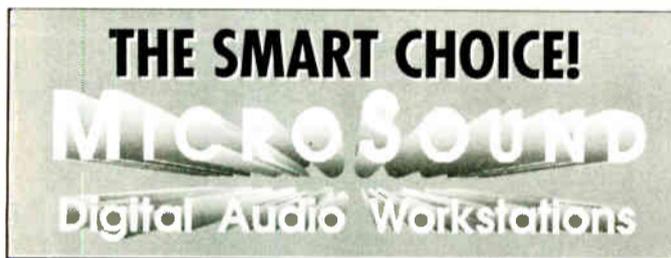
I don't believe the costs involved in such a leasing arrangement would be substantially different from prices currently being paid for stations. A major difference would be, however, that the public, rather than a private individual or corporation, would be paid for the use of the spectrum. This should remove the "need" for governmental regulation of content, giving broadcasters full First Amendment rights.

Such a radical change would certainly disrupt the existing station trading market. It could, however, be introduced several years in the future (perhaps ten years) to avoid "changing the rules in the middle of the game."

Spectrum leasing could perhaps result in full First Amendment rights for broadcasters. Micro-broadcasting could allow a multitude of voices, allowing broadcasting to serve very small specialized audiences (a sort of neighborhood radio) as magazines serve small specialized audiences in print. I look forward to your comments.

□□□

*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 and just returned from the Alta Sierra Dance Camp. He can be reached at 805-541-0200. He can also be reached on internet at ap621@cleveland.freenet.edu.*



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# WORKBENCH

## An Easy Way to Demagnetize a Capstan

by John Bisset

**FALLS CHURCH, Va.** A few columns back, Jon Hall of Hall Electronics in Charlottesville, Va., told about magnetized solenoids and motors on Otari MX5050B machines. Victor

Long of SRF Audio hasn't experienced that problem with his Otaris, however, he did encounter magnetized capstans on Revox A700s and B77 machines. The capstan is the motor shaft in these units, and is easily removable.

Using the square type of cart degauss-

er, the shaft was degaussed. Victor rolled the capstan shaft with his fingers as he demagnetized it and continued to roll the shaft as he slowly pulled the motor/capstan assembly away from the degausser. The procedure had to be repeated several times on one shaft, but the result was a successfully demagnetized capstan shaft.

Determining whether your tape guides, capstans, etc. are magnetized is simplified using an inexpensive magnetometer. Victor uses the model 20/5-0-5 manufactured by the R. B. Annis Co. The magnetometer is also useful in determining whether the devices have been properly demagnetized.

Victor encountered a problem using the magnetometer. He would get both erratic and unrepeatable readings. The cause was simple enough—the device is

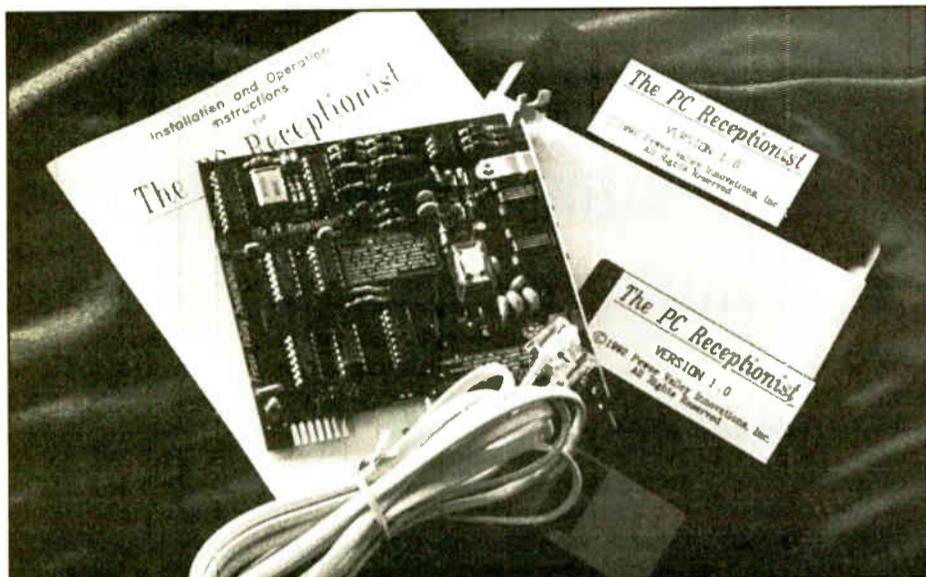
wire is much easier. Because the reel turns as you pull the wire, there's no kinking or curling of the wire.

Jon Banks at WLTT-FM Washington showed me this trick, though he gives the credit to a creative telephone man. What's that about an oxymoron?

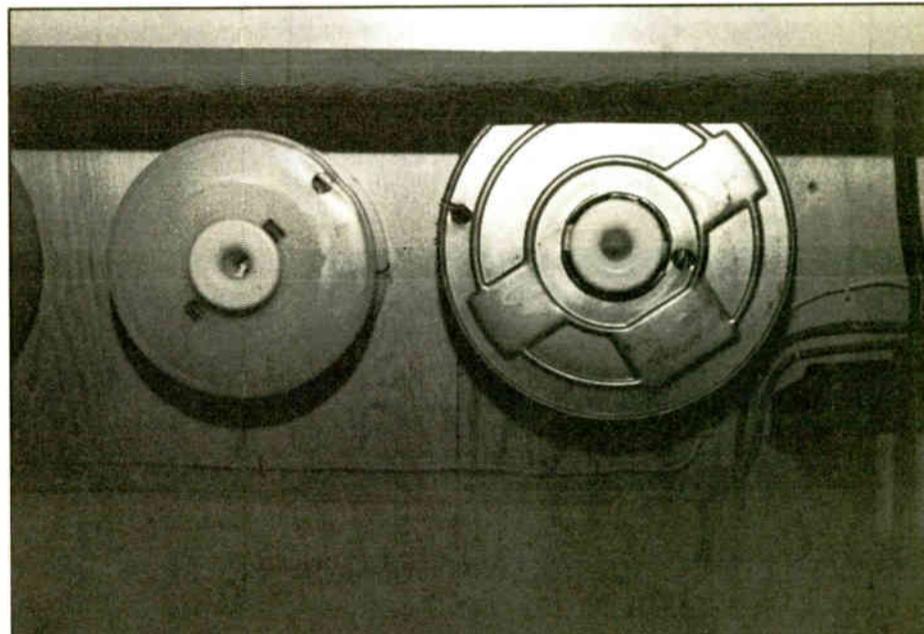
★ ★ ★

Pewee Valley Innovations, in Crestwood, Ky., has introduced a new caller ID accessory for use with personal computers. The PC Receptionist maintains a record of anyone who calls, keeps track of how much time is spent on the phone and with whom, and prevents unwanted callers from disturbing you. When connected to your computer modem, the PC Receptionist will restrict access to authorized callers, eliminate password or touchtone code access methods, and prevent hackers from tying up your system.

If you have a pager, the system will forward the caller's number to your pager while you're away from the



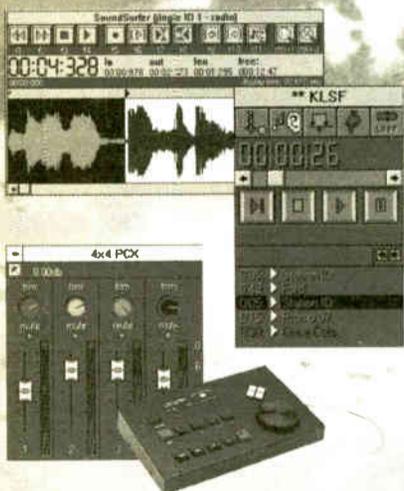
The PC Receptionist provides both protection against hackers and call-monitoring using Caller ID.



Reels of telco cross connect cable can be stored off the floor, yet with easy access by using spare cable spindles.

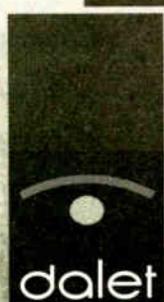
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sensitive enough to read the magnetic field of the earth.

To properly use the magnetometer, you need to turn it in free space, away from your equipment, both horizontally and vertically, until you find the orientation at which it reads "0." Then, place your equipment on the bench in such a way that you can hold the magnetometer in that same unvarying orientation as you move it into and away from each part you are checking. When this measurement procedure is followed, the readings will apply to the parts only—not to Mother Earth!

For more information on the R. B. Annis magnetometer, circle **Reader Service 93**.

★ ★ ★

The next time you're in your telephone closet, grab that reel of cross connect wire that's always getting stepped on and make use of one of the wire spindles that are used to route the phone wires off the punch blocks. These spindles screw off and are just the right diameter for the 5- and 7-inch reels of cross connect wire. Not only does the spindle get the wire off the floor, but since the reel spins freely on the spindle, pulling off just the right amount of

office—thus you no longer have to give out your pager or cellular number—a caller dials your office number, and you decide who gets through to your pager.

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□ □ □

John Bisset is a principal in Multiphase, a contract engineering and projects company. Workbench submissions can be mailed to **RW**, or faxed to his attention at 703-998-2966. Published submissions qualify for recertification credit for all levels of SBE certification.



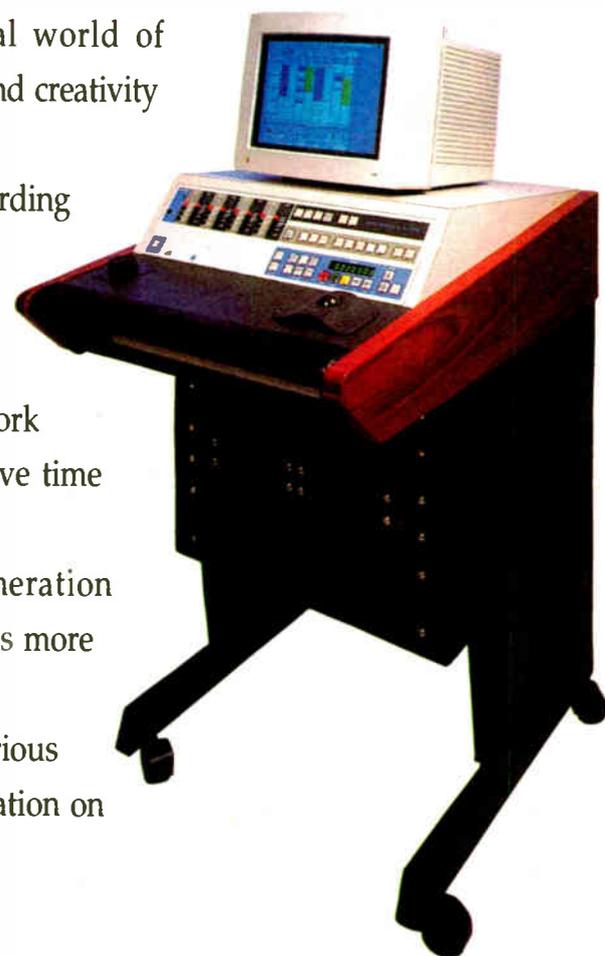
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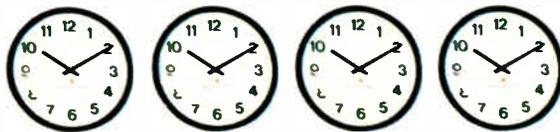
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World Radio History

# Contractor Amasses Years of Wisdom

by Mark Persons

**BRainerd, Minn.** It has been a few years since I last wrote for **RW** on a regular basis. I have been busy building and repairing radio stations. My client base is still about 40 stations. I visit each one or more times a year. The core of ten call on the telephone weekly or at least monthly.

Because I am chief operator at none of them, the after-hours phone calls are down to a mild roar in comparison to the past. The stations pay time and material. None are on "contracts" of any sort.

## Young old man

After 15 years of on-the-road engineering I have elevated myself to the "old man" status at the tender age of 47. This status comes partly from encouraging contract engineers with less experience to do the everyday cart machine cleaning and weekly transmitter checks. I let them replace the transmitter tubes and then call for advice during the day when the transmitter is not running exactly as it should.

The other part of this status comes from accumulating enough high-tech test equipment to solve the difficult problems. They arrange an appointment for me to visit the station with a spectrum analyzer or wattmeter and dummy load. I enjoy this arrangement, and it makes for fewer emergency calls.

Each contract engineer has the ability to build and shape his or her business in almost any way. It is amazing to watch how each contractor does business. Some take absolute control of all engineering at a station and nothing can be done without them. While this gives good consistency in how the facility is engineered, it can lead to problems when that one person is sick or on vacation. Also, they can serve only a few stations because of the obvious workload.

I personally like to see the chief operator at any station do as much for the station as he/she can to save money. It sometimes shows in haphazardly run wiring and dirty transmitters. However, it is good training. This training pays off when there is an emergency, as I can direct these people over the telephone to solve problems. As a result, I service more stations. Most contractors fall somewhere in the middle of these two extremes.

## Lessons learned

When I first started out fifteen years ago, I had contracts. The contracts allowed anyone at any contract station to call me at any time. You guessed it, one night at 2 a.m. an operator called to report the light in the bathroom had burned out. He assumed I would go to the station right away to take care of the problem. Needless to say I was not thrilled. That was the beginning of the end of contracts for me.

Every contractor has stories like the client who sends a check for a long overdue bill and then calls just a few days later to ask for more service. I have a client who does that and it is comical. He assumes his status is elevated to "good guy" just in time for his next bill.

My wife Paula works in our business full time. She answers the telephone, handles the word processing, invoices clients and does the UPS shipping. She knows the clients and the clients know her. They know she is there to answer many of their questions.

Paula also has the phone numbers so that they can reach me in an emergency.

She takes care of ordering parts for clients and many times I don't know that it got done. This kind of teamwork has been invaluable to our business. It leaves me free to do the technical work. Most contractors are not as fortunate to have a wife trained as a professional secretary.

One of the things Paula does is carefully watch delinquent client accounts and reminds them when there is an overdue invoice. This is extremely important, as the older an invoice gets the more difficult it is to collect.

A good way to have a sound business relationship with a client is to start out on

a firm footing. I always give the client a copy of my rate card during the first moment of our first meeting. We talk about how I do business and how payment is to be made. If he has questions he asks them and gets the answers before any work is started.

## Being accomodating

This policy has proven interesting when the station is off the air and the client is losing revenue every moment we discuss the billing. If he is a new client, I almost always pick up a check before leaving. In return, he receives a detailed written field report and invoice in the mail within a week. If it was necessary for the client to

write a check in advance for an approximate amount, my office will issue a refund check for the unused money. It will be included with the invoice.

Our bookkeeping is not set up so that I can give the client an invoice while on the job. Instead, Paula must produce the invoice in the office with Minnesota state sales tax for any parts used.

This article was just to let you know where I am coming from in contract engineering. In future articles, I want to explore the radio broadcast engineering business in more depth.

□□□

Mark Persons is principal of Mark Persons and Associates, a radio broadcast technical consulting firm based in Minnesota. He can be reached at 402 Buffalo Hills Lane, Brainerd, MN 56401; telephone: 218-829-1326.

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OFFBEAT RADIO

# Tourist Radio Format Is Successful

by Dee McVicker

**PENSACOLA, Fla.** A Florida AM station has tourists in the cross hairs and is aiming at this market to put it and possibly other AMs in the black again.

So far, the outcome looks good. "We took a negative AM here that was simulcasting with its FM and turned it around to a positive. We're actually making a profit," said David McDonald of Pensacola station WTKX(AM), known as "Florida Information Radio."

McDonald signed a local marketing agreement (LMA) with WTKX license holder, Holt Corporation, early in 1992 and soon after began airing the travel and tourist information format. He bills the format as an entertainment "electronic billboard" for tourists, and believes it is a solution for ailing AM stations.

"It's an AM savior format and we're trying to promote it across the country," said McDonald, who recently began promoting the programming concept under affiliated company, Travel Net USA, to help other stations get started.

Currently, there are a half-dozen stations in the United States broadcasting travel information on a regular basis.

**A local hero**

According to McDonald, the advertising dollars the format goes after is what gives AM stations that broadcast it a unique advantage in the community. WTKX has

become "somewhat of a hero" because community leaders view it as helping to bring more people into the area and a boost to local economy, he said.

Moreover, he added, stations that broadcast the format on their AMs often can bring more business to their affiliated FMs because many of the people who sit on tourism boards are also those people that drive the local economy and have businesses that need to advertise.

"In fact, we cross plug with two of the FMs in town we're not even connected with," he commented. Broadcasting tourism information also lures businesses that historically do not advertise on radio. McDonald cited hotels/motels as one example. Like a lot of tourist businesses, he said, "they do their advertising on billboards."

Other prime advertising targets are golf courts, restaurants, lounges, sports and entertainment parks, and the thousands of national businesses wanting to promote services and products aimed at tourists. Declared McDonald, "You can get people on the air that have never been on the air before."

McDonald, however, is the first to admit that the tourist and travel information format isn't easy to implement. "You can't run (the tourist format) like normal radio....Our clients most often run two commercials an hour, 24 hours a day. You do that because you've only got 20 to 30 minutes of a listener's listening span."

WTKX market penetration is based on

the premise that tourists tune to the station as they're entering into the Pensacola area, and then only long enough to get the information they need. Studies indicate the time span is roughly 20 minutes, according to McDonald.

To capture this market, WTKX has 24 billboards on various roadways leading into Pensacola informing travelers to tune to its frequency. At peak tourist season, WTKX runs two-hour loops of programming covering anything from fishing, golfing and museums, to an archeology dig of an old Spanish fort going on downtown.

**Audio tour guide**

Programming includes interviews of tour guides, actualities of events, or coverage of any other related tourist attraction. McDonald calls these information production vignettes.

"We went to the zoo for instance; we literally rode the train with the director of the zoo talking, and as we go into the Japanese garden, for example, we put Japanese music in the background," he cited as one vignette.

The station broadcasts tourist and travel information full time, with the exception of off-season months when northern Florida has a stagnant tourist population. During these winter months, the station uses sports to replace tourist revenue and tourist programming runs around "550 to

600 hours a month and the rest is sports. We do Larry King also. It doesn't fit the format, but it works," said McDonald. "We have to eat in the winter."

Because of its heavy emphasis on information gathering and on-location productions, the tourist format is not one of radio's easiest to administer. McDonald estimates there are 300 hours of production time tied up in the current material being aired on WTKX.

McDonald, a veteran in the tourist industry, is also quick to point out that stations making the plunge into travel and entertainment programming will generally require an advertising sales staff familiar with the unique, often political, needs of this marketplace. "The key is knowing who to contact," he remarked.

As for the latest terrorism on Florida's tourists, who are being gunned down on roadways by tourist snipers, McDonald said he's seen no indication that there's a slow-down in the Florida tourist trade because of it. "We just had our seafood festival here and we had over 100,000 people across the week," he said.

McDonald, however, has checked with the State of Florida Tourism Bureau regarding airing public service announcements that would offer some protection against tourist snipers. This is now being discussed and a series of announcements could be forthcoming as a result.

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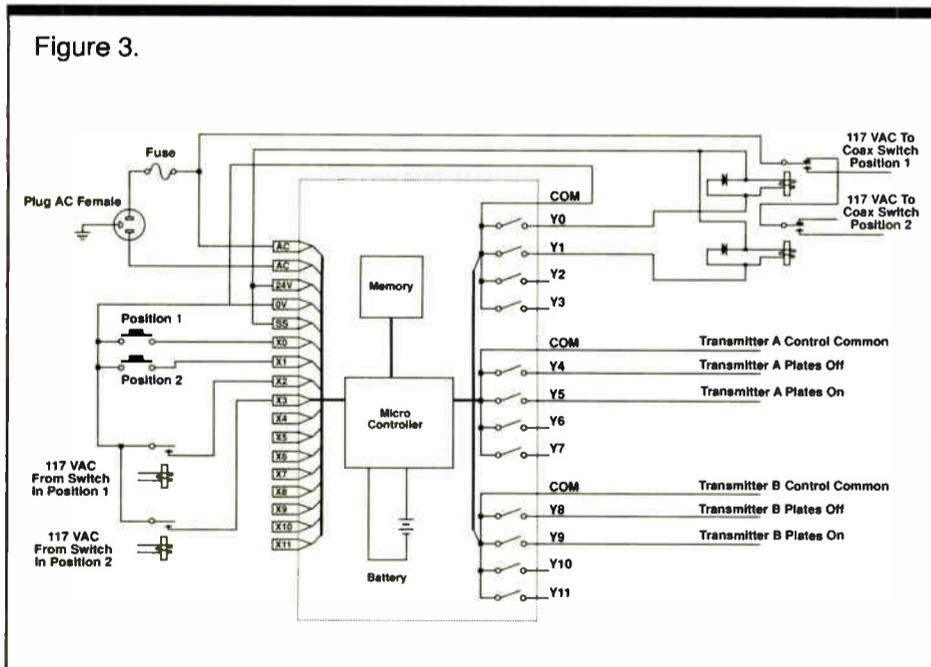
Dee McVicker is a freelance writer and regular contributor to RW. She can be reached at 602-545-7363. Travel Net USA can be reached by calling Boogie Inc. at 800-526-6443.

## Knowing the PLC Buttons to Push, and Installing Them

► continued from page 34

tacts from your remote control in parallel with the buttons shown or you can assign any of the unused inputs for this task. Remember, you can program the inputs and outputs of the PLC to perform what-

save time in your station. If you decide to build a project like the one presented here using a PLC, remember all facilities are not alike. You must make sure that your particular design will work with your equipment.



ever task you want. The unused output relay contacts can be used for tally to other equipment.

Once again, this is a conceptual, and not a do-it-yourself, nor a one-size-fits-all, project. These articles are intended to introduce you to PLCs and give you a taste of what they can do, how the basic units work, and how they can be used to

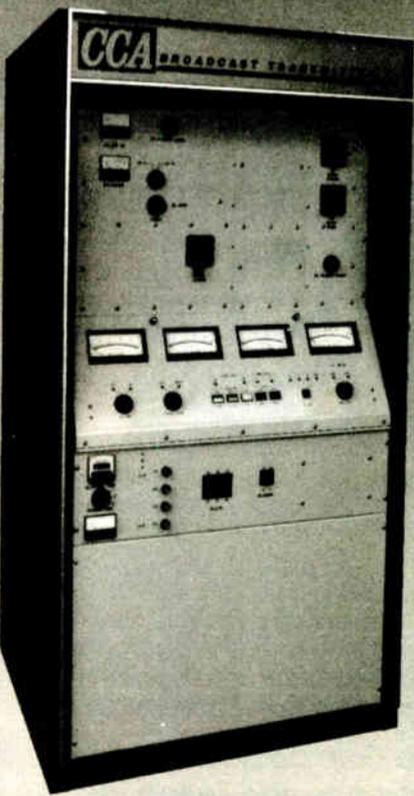
Next month we will close this series of articles with the programming required to make the PLC function.

□ □ □

Richard Mertz is senior engineer at Jules Cohen & Associates, P.C. He can be reached at 1725 DeSales St., N.W., Suite 600, Washington 20036; telephone: 202-659-3707.

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## GUEST COMMENTARY

# EIA on DAR: We Need It, We Will Have It

by Gary J. Shapiro  
Group Vice President  
Electronic Industries Association

**WASHINGTON** Other than high definition television, nothing can draw quite as much emotion from electronics manufacturers and broadcasters as digital audio radio. If you need proof, look no further than the various trade magazines—including this one—targeted to professionals like you.

Everyone, it seems, has an opinion about digital audio radio. You might say, "As well we should!" And you'd be right. We all have a stake in the technology. The question appears to be, "When it becomes a reality, will digital audio radio work for me?" The answer is yes.

The Electronic Industries Association (EIA) DAR Subcommittee will begin comprehensive testing of six proponent systems around New Year's Day. The subcommittee's charter, as I have stated previously, is to organize and initiate a fair and impartial analysis, testing, and standards-setting program to determine which DAR technical system will best serve the consumer electronics and broadcasting industries and consumers.

Testifying before the House Subcommittee on Telecommunications and Finance in 1991, I said that "EIA and its members believe in the future of digi-

tal radio. We believe the FCC should select a system based on industry consensus and grounded in considerations of technical merit, economic practicality and consumer benefits." This still holds true today.

The EIA DAR Subcommittee has

**This is a new technology,  
requiring creativity and flexibility.  
The pieces are falling into place.**

achieved remarkable consensus in its efforts to move the DAR process along. Scheduling changes that have been encountered as the process continues are to be expected, as they should be with any complicated process that affects the interests of so many involved parties.

Proponents drop out of the process for various reasons. Testing procedures need refining as the players—and proposed systems—change. Choosing and setting up a testing laboratory is an extremely detailed and intricate task. This is a new technology, requiring creativity and flexibility. The pieces are falling into place now, and, before you know it, testing will begin.

Testing will be centered around identifying the level of performance of the proponent systems relating to a wide variety of

characteristics, including the quality of the digital audio signal; the performance of that signal as it is impaired in an RF environment; the coverage range, compared with current effective ranges of broadcast systems; compatibility with existing services; and the ability to carry

data that can broadcast services other than those that are audio-based, which could be sources of revenue to broadcasters and, at the same time, benefit the public.

The objective and subjective test results will lay the basis for informed decision-making on system selection. Committing now to a particular implementation strate-

of the 1960s to today's sophisticated autosound systems.

Consumers have already embraced digital sound for the long haul. Consider the 42 percent household penetration of home CD players, and the 10 percent penetration for autosound CD players. Sales of CD players for the car, for example, were up 25 percent in July 1993 over the same period last year, and sales of multi-play CD players for the home are up 15 percent during the same period. And don't forget digital audio tape, digital compact cassette, MiniDisc and the digital sound that will emanate from high definition television.

In other venues, like radio stations, where a good percentage of music is broadcast from CDs, digital is more often than not the preferred way of conducting business.

Digital, in the form of compact disc players, accounts for more than 30 percent of all audio hardware purchase dollars. Compact disc sales have overtaken sales of cassettes and become the number one preferred format of choice for consumers. And, according to our research, more than 80 percent of consumers familiar with CD want a radio with CD-quality sound.

It seems obvious that the world is going digital, and, because of this, digital audio radio makes sense. We are about to bear witness to an historic process that will result in a dramatic rebirth for the medium we all have embraced for 73 years. Keep an open mind as the process plays out over the next several months, culminating in the choosing of a digital audio radio system (or systems) from which we can all benefit.



Gary Shapiro

gy is premature, as is committing now to a certain system without knowing whether the technology even works, or, if it does, how it compares to the other proposed systems. And that's where we are today—gathering the objective data for comparative evaluations.

Digital audio radio is being actively pursued in the international arena; it is important that the United States move ahead on this technology as well. The EIA DAR Subcommittee will continue to work hard to make this happen so that a DAR system (or systems) can be chosen and recommended to the FCC next year.

With all of the controversy about digital audio radio, it might be valuable to take a step back and remind ourselves why we need this technology—and why it makes perfect sense.

Radio has evolved dramatically from the "radio music box" that David Sarnoff proposed to the Marconi Wireless Telegraph Co. back in 1915. When the first receivers went on sale in 1920, it is not likely that many people had any idea that the medium would become what it is today.

When digital audio radio makes its debut, it will surely have an incredible impact on people, probably very much like the way that people reacted to the change from black and white to color television, or the change from AM car radios

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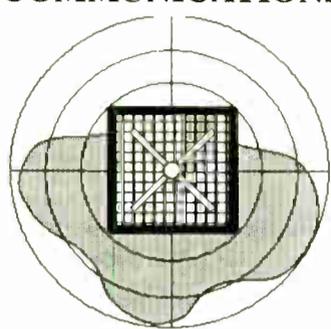
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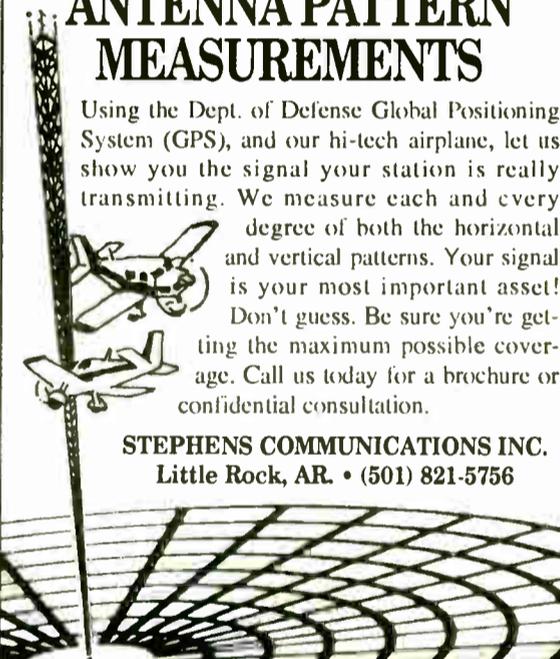
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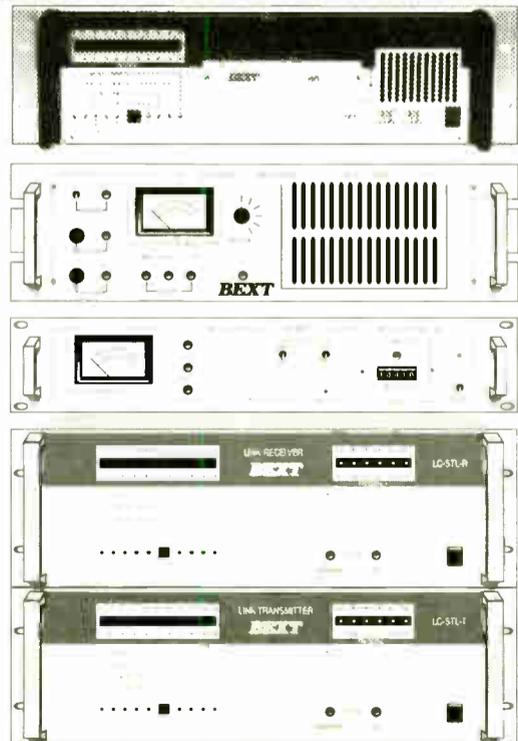
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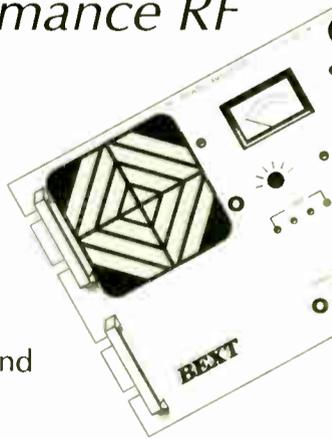
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Want To Sell

New 250 W solid state amp, \$1800. Call for details. Bill Hoffman, 518-583-9490.

**Belar RFA-1** tuned to 89.3, gd cond, \$200/firm. L Holley, CCS Prod, POB 34321, Houston TX 77234. 713-944-7959.

**Crown D-60** rack mount in good condition, \$200/Best Offer. R Gleen, WJUR, Wimauma FL 33598. 813-634-1940.

**Digital Process 4 chnl stereo head-phone amp**, very clean, like new, \$129. W Dougherty Jr, WLD Recdg St, Music Valley Rt 1, MMill Spring MO 63952. 314-998-2681.

**Harmon Kardon CA40** tube amp, 40 W, 4 low imp mic inputs, quality unit, \$65; Magnecord 10 W tube monitor amp, been rebuilt, on rack panel, \$35; Altec preamp modules 1588A, B, C, 1578A, 1579A, \$20 to \$35/ea. E Davison, POB 7167, Springfield IL 62791. 217-787-0800.

**LA Sound LEP512** 5 band preamp, EQ, w/2 Hermosa 1505 150 W pwr amps, BO. B Cameron, WWKS, 1316 Seventh Ave, Beaver Falls PA 15010. 412-846-4100.

**Marantz 8-B**, excel cond, \$1350; Marantz 9's (2), \$7500. David, 305-866-5401.

**Peavey Musician Mark III** guitar/instrument amp, 2 channel, 400 W, auto-mix with footswitch, 4 x 12" speaker cabinet, mint condition, under 100 hours total use, \$450 firm plus shipping. J Tanis, Civitas, 925 N Northlake Dr, Hollywood FL 33019. 305-920-4218.

**Remko DA-6 RS**, 1x6 dist amp w/rack mtg, \$65. E Davison, WNNS, POB 7167, Springfield IL 62791. 217-787-0800.

**RTS-405** stereo TT preamp, 2 @ \$145 ea plus shpg, used 6 mos, then stored. B Lord, Lord Bldg, 13313 SE 208th St, Kent WA 98042. 206-631-2374.

Want To Buy

**Harmon-Kardon, Marantz, McIntosh** amps, preamps, tuners, tubes, owners/service manuals, etc wanted. R Gleen, WJUR, Wimauma FL 33598. 813-634-1940.

**Heathkit AA-1640**, 200 W solid-state amplifier with manuals. R Rosenow, KTTs, POB 2180, Springfield MO 65801.

**PLFM-100** obsolete exciter upgrade ... \$229.95  
**CSG-10** stereo generator w/comp clipper ... \$349.95  
**BIA-1** optimized balanced interface ... \$249.95  
**\*FMT-15** 15W FM xmitr ... \$1,495  
**\*FMT-15S** stereo FMT-15 xmitr ... \$1,895  
**\*RTU-1** remote controlled tuner ... \$495

**JT Communications**  
904-236-0744 fax 904-236-5130

Circle (111) On Reader Service Card

**McMartin LT-80C, 108C, & MS105** amplifiers wanted working cond. E Davison, POB 7167, Springfield IL 62791. 217-787-0800.

### WANTED:

Pultec EQ's; Fairchild, Teletronix, dbx, UREI, Sontec Limiters. Neumann, Telefunken, AKG and RCA mics. MacIntosh or Marantz Gear; Lang, Neve and API gear. Misc old tubes and guitars.

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**TOWERS...bought and sold. Call 1-800-393-2266.**

**Andrew A10R50507** coax, new 1-5/8", (2) 275' rolls, \$7/ft. S Ross, WQFE, 733 N Green St, Brownsburg IN 46112. 317-852-9119.

**Electro Impulse C7797/DPTC** 25K FM dummy load, used twice, \$3000/BO. M Grubbs, KATG, POB 1047, Luling TX 78648. 210-85-2555.

**ERI FML-1E** 4 year old rotoliter antenna on 95.3 MHz, excellent condition, \$1000. M Persons, KAGE, 752 Bluffview Circle, Winona MN 55987. 218-829-1326.

**ERI SHP-1AE** single bay, CP, tuned to 90.7 MHz, \$1500/BO. M Ebron, WOTJ, 4723 Country Club Rd, Morehead City NC 28557. 919-240-1600.

**Gate/ERI CP-239**, 3 bay FM w/tower brackets for 18" face w/heaters, mates to EIA flange, TX power 2.2 kW equals 3.0 kW ERP, circular polarized, \$995 plus shpg. F Vobbe, GNBC, 419-228-4199.

**MTI motorized coaxial switch**, 50 ohm, 4 port, 6", \$3000; Myat 50 ohm, 6" to 3" transition, coaxial (4), \$500 ea. R Miller, WGBY, 44 Hampden St, Springfield MA 01103. 413-781-2801.

### JENNINGS VACUUM CAPACITORS FOR SALE

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Fax: 416-421-3880

**Phelps Dodge CPLPFM4** 4 bay w/radomes tuned to 95.3, \$990; 170' 7/8" coax, \$150. R Boesan, KDKD, Box 448, Clinton MO 64735. 816-885-6141.

**Shively 6813** 3 bay tuned to 92.7 MHz in great shape, BO; Andrew 70' 1-5/8" w/connections; Andrew 90' 3-1/8" both w/grounding, gd cond, BO. C Hall, KYKN, POB 165, Naphi UT 84648. 801-623-4010.

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**Two homspun type WG 50 ohm** dummy loads, 2 kW each, toaster element type, \$250 ea. L Nixon, Classic City Prod, 1094 Baxter St, Athens GA 30606. 706-613-6724.

**Utility Tower (2) 380'** w/insulators, guys & lights, on ground ready to ship \$4560 ea. J Proctor, WCRJ, 980 FM 1746, Woodville TX 75799. 409-429-3679.

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Want To Buy

FM 3-bay or 2-bay at or near 103.3, fax info. C Tiemann, WAIV, Box 103, Spring Valley IL 61362. 815-663-0103.

**ADC 48** patchbay phone jack. D Nelson, 619-758-0888.

**Orban 111B** Dual Reverb, \$450, Shure Mixer M-267, \$300. 407-423-1365.

**Audio Digital TC-2** digital delay unit, no manual, \$490 prepaid UPS. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

### AUDIO PRODUCTION

Want To Sell

**Smartcaster**, computer, digital audio: live or automated. D Nelson, 619-758-0888.

**ADC 144 Pt TT patchbays**, excellent condition, 1 rack space, 3 rows of 48, top 2 rows normalised, \$129 (you remove old wiring) or \$199, we totally refurbish with new front panel, ready to install. TT cords at cost with purchase! Also 1/4" PB's. Audio Village, POB 2902, Palm Springs CA 92262. 619-320-0728, or Fax 619-320-2454.

**dbx 155 (2) Type I** encode/decode NR, \$200 ea or \$350/both. P Cibley, Cibley Music, 138 E 38 St, NYNY 10016. 212-986-2219.

**dbx 150** Type I NR system, \$100; UREI 530 9 band stereo graphic, \$150; UREI 535 10 band stereo graphic, \$200. D Lundy, Lundy Tape Duplicators, Cumberland Gap Pkwy, Keidrick KY 40949. 606-546-6650.

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**Eventide H949** Harmonizer w/manual, excel cond, \$500; Eventide BD 955 delay, excel cond, \$500. J Katz, KJUG, 396 Buckley Rd, San Luis Obispo CA 93401. 805-541-8798.

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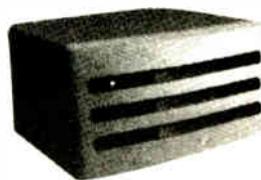
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### AUDIO PRODUCTION...WTS

Burwen DNF-1201 dynamic noise suppressor for phono rcds, clean, \$50; Technics SH9010 5 band parametric EQ rkt mtg, like new, \$275; Daven (2) 500/500 ladder atten with cue on panel with ADC 1-1 transmitter, \$50; Surround sound processor, Shure HTS5000 Home Theatre, like new, \$100; Stereo EQs 5 & 6 band unbal RCA conn clean, \$35. E Davison, POB 7167, Springfield IL 62791. 217-787-0800.

Sparta TPA 7-1 (3), new, 25 W audio modules for MAS-50 monitor amps, \$40 ea or \$95/all prepaid UPS. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

Orban 622B parametric EQ; (2) dbx 160x compressor; Valley People 430 Dynamite, 2 chnl; CE 1700 DDL; Aphex Type B exciter. S Erickson, Erickson Audio Prod, Brooklyn NY 11238. 718-638-8610.

Orban 245 E stereo synthesizer, new cond, \$150. L Nixon, Classic City Prod, 1094 Baxter St, Athens GA 30606. 706-613-6724.

Orban 111B stereo reverb, \$300. M Rollings, WZNF, 400 Broadway, Urbana IL 61801. 314-458-5595.

Orban stereo synthesizer, \$150 each plus S&I; Orban stereo compressor, \$250 each plus S&I. F Vobbe, GNBC, 419-228-4199.

Yamaha SPX 1000 digital audio processor, like new, \$1200/BO; Audio Technica ATRMX 64 6 channel mixer board w/EQ & cassette recorder, like new, \$500/BO. M Grubbs, KATG, POB 1047, Luling TX 78648. 210-875-2555.

### Want To Buy

Fairchild 600 conac or 602 Conex high freq limiters. J Gangwer, 942 32nd St, Richmond CA 94804. 415-644-2363.

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Phase Linear 1000 autocorrelator schematic & IB, original or gd copy OK. R Caldwell, WTVF, 474 Jas. Robertson Pkwy, Nashville TN 37219.

Eventide H-969 or similar pitch shifter. K Carlson, KTFI, POB 2820, Twin Falls ID 83301. 208-733-3381.

### AUTOMATION EQUIP

#### Want To Sell

Otari ARS1000 PB, like new, (3) \$1000 ea. J Fuller, WJFJ, 26 Woody Hill Rd, Hope Valley RI 02832. 401-539-8502.

Gates SC 48, 3 racks, w/(2) stereo SMC Carousels, (2) mono SMC Carousels & (2) Scully PB decks, \$1000/BO. L Nixon, Classic City Prod, 1094 Baxter St, Athens GA 30606. 706-613-6724.

Harris 9000 w/(3) SMC 350 & SMC 250 mono Carousels, \$1000. M Persons, KAGE, 752 Bluffview Circle, Winona MN 55987. 218-829-1326.

Harris 9002 (5) ITC 750/720 PBs, 48 trk mono Instacart, (3) cart deck PBs, (2) VOTs, manuals & schematics, in use. J David, KMPL, PB 907, Sikeston MO 63801. 314-471-1520.

Scully 100 automation system, \$300/BO. J Kesler, WOBZ-TV, POB 220, Livingston KY 40445. 606-843-2209.

IGM SC, complete automation system w/16 inputs, relay card plus spare cards, (5) IGM G-Carts & (3) Otari ARS 1000 stereo PB R-R's, IGM encoder w/terminal & keyboard. J Lotspeich, KTSM, 801 N Oregon St, El Paso TX 79902. 915-532-5421.

NBC Hotline decoder, hook to NBC audio, gives contact closures for automation & alerts, \$250. E Cary, WLKX, 15226 W Freeway Dr, Forest Lake MN 55025. 612-464-6796.

Revox PR99 (3) PB units w/25 Hz tone detectors, 7.5 & 3.75 ips, rack mounted in great cond, \$700 ea. E Gross, KEYZ, POB 2048, Williston MO 58802. 701-572-5371.

Smartcaster digital automation system, computer, 5 hrs record time, complete, in service, \$4900. G Kauffman, KCLN, 1853 442nd Ave, Clinton IA 52732. 319-243-1390.

SMC Controller, Pro 1 Brain to control unit, \$1500/BO. R Coleman, WGEN, 1003 Oakwood, Geneseo IL 61254. 309-944-4633.

VRC-2000 compatible data terminals, QUME QVT-101, \$75 ea. G Finney, WPWB, 7137 Heather Ln, Macon GA 31206. 912-788-2124.

#### Want To Buy

TM Century Auto-Seque controller/Brain. R Michaels, SCB Inc, POB 7762, Amarillo TX 79114. 806-355-1044.

### CART MACHINES

#### Want To Sell

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.

ITC triple deck play unit stereo, 2 tone, \$700; ITC Delta players, 3 tone mono (2), \$700 ea, stereo record brain for Deltas, \$400; Fidelipac Dynamax CTR 100 PB (3) stereo, manuals, \$550 ea. Evan, 1-800-583-7799.

Audicord E-20, new, R/P, \$750. G Grassie, RNTC Bdctg, POB 146, Dexter NM 88230. 505-734-5565.

### CART MACHINES:

ITC - Fidelipac - BE  
For Sale: \$395 & UP  
Repairs: \$100 per deck + parts  
Recond: \$150 per deck + parts.  
Financing Available  
Call Mark @ 619-758-0888

BE 5300 triple deck mono, excel cond, in use w/sec & tertiary tones, \$600/BO. K Carpenter, Fietz/Sleman Prod, 40 Fourth St #217, Petaluma CA 94952. 707-763-0191.

Fidelipac CTR-112 stereo cart PB, sec & ter tones, very clean, \$700; Spotmaster 500-BS stereo cart R/P, lw hrs, excel cond, \$400. P Bammerlin, WRQK, 4111 Martindale Rd, Canton OH 44705. 216-492-5630.

Harris Criterion compact stereo R/P decks (2), \$400 ea/BO; (2) Harris Criterion 90 stereo R/P decks, \$500 ea/BO; (3) Harris CC-III stereo triple decks, \$500 ea/BO; Fidelipac CTR-112 stereo play, \$600/BO. K Carlson, KTFI, POB 2820, Twin Falls ID 83301. 208-733-3381.



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ITC Delta triple play, mono with tones, (2), excellent condition, \$110 ea/\$2000 both; ITC Delta single play, mono, with tones/ff, excellent condition, \$450; Dynamax CTR 11 mono play w/ff (2), excellent condition, \$425 ea/\$800 both; ITC Series 99 R/P, with tones, working condition, \$250. J Katz, KJUG, 396 Buckley Rd, San Luis Obispo CA 93401. 805-541-8798.

ITC Delta III triple stack stereo cart machine w/record unit, like new, will pay shipping, \$4000. C Curelop, KLOS, 301-840-4836.

ITC stereo rec & PB, new in box, will trade for R-R 8 track in good condition. Stars of Tomorrow, 2725 Forrest, Nashville TN. 1-800-530-9255.

## EMPLOYMENT

To place ads in this section, use the ActionGram form. To respond to box numbers write Radio World, PO Box 1214, Falls Church, VA 22041. Attn: \_\_\_\_\_

### HELP WANTED

Transmitter engineer to work aboard our shortwave radio ship in warm southern waters. Lots of adventure for the right person. Contact Scott Becker, Voyager Broadcast Services, 229 N 5th Street, Kiowa, Kansas, 67070. 316-825-4552.

Nationwide Communications Inc's, WPOC-FM, Baltimore, Md, has an opening for a chief engineer. Experience is necessary in high power FM, studio maintenance, and remotes, applicant must be familiar with PC based computer network systems. Management skills are necessary and SBE certification, a plus. Reply to Robert Reymont, Director of Radio Engineering, P.O. Box 5159, Mesa, Arizona, 85211-0500, (602) 964-4000 for more details. EOE.

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12 year host of college FM oldies show seeks weekends to continue show. D Hogenmiller, 4612 Theiss Rd, St Louis MO 63128. 314-894-8194.

25 year old in search of FT CHR or Hot AC gig. Rick Savage aka Rick Allen. 216-773-1549.

Attention Arizona, recent graduate on the prowl, welcome me to your jungle, I want to rock. David Kyi, 602-378-0105.

Broadcaster w/17 yrs exper seeks announcing C/W format, NW NC, SW VA preferred, vast knowledge of C/W, real personality, great voice, production. Ron, 919-679-7035.

Broadcaster w/6 yrs exper, college graduate w/degree, exper in sales & concert promoter, will relocate, call 908-671-6491.

Lovesble DJ ready, willing & able to hit the airwaves in a new home. Call Steve 405-348-7404.

Experienced, accountable AM/FM CE, excel troubleshooting skills, SBE certified, FCC general, degree. Currently employed, desire NE. Write to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box #09-22-01RW.

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Experienced female broadcaster seeks PD/MD's position in Cincinnati/Dayton/Columbus area, currently news dir, have been assist PD, PSA & MD. Call KJB, 513-382-5001.

New grad w/fresh ideas looking for start in southeastern US as on-air/production talent, ready, willing, able & trained to start immed. Kay, 405-733-1355.

Engineer w/with 8 years experience, AM including DA, FM, satellite & automation, prod, on-air, computer, prefer SE. Richard, Rt 1 Box 91C, Carrollton AL 35447. 205-367-2113.

Young fireball with awesome production & copywriting skills, natural finesse in on-air talents, will relocate, recent broadcasting school graduate. Lori, 405-794-6495.

Female graduate of broadcasting school is eager to get started, prefer R&B, gospel or urban contemporary formats. Desire sales or production. Katrina Perry will relocate. 405-751-4022.

Seeking return to radio. On-air/production, great voice, exper several formats, computer literate, traffic manager exper, mild climate only. Jim, 813-461-3192.

## ABOUT OUR EMPLOYMENT SECTION

**HELP WANTED:** Any company or station can run "Help Wanted" ads for \$1.50/word or buy a display box for \$55/column inch. Payment must accompany insert, use your MasterCard or VISA; there will be no invoicing. Blind box numbers will be provided at an extra charge of \$10. Responses will be forwarded to listee, unopened, upon receipt. Call 800-336-3045 for details.

**POSITIONS WANTED:** Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a \$10 fee which must be paid with the listing (there will be no invoicing). Responses will be forwarded to the listee, unopened.

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Attn: Simone Mullins

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**Radio World**

Call Simone Mullins at:  
1-800-336-3045  
or FAX:  
703-998-2966

### CART MACHINES...WTS

ITC stereo & mono machines, R/P & play only, single & triple decks, all w/3 tones, call for individual prices. D Matyis, KVET, 705 N Lamar, Austin TX 78703. 512-495-1300.

ITC triple deck PB only, mono, \$750/BO. R Coleman, WGEN, 1003 Oakwood, Geneseo IL 61254. 309-944-4633.

Pacific Recorder Micro-Maxx, like new w/standard heads & speeds, rack mountable metal casing, manuals & pwr cords, \$1200/pair. K Rosato, Sound Bdcg. 914-645-1626.

RCA RT-27 monophonic, all 3 cue tones, rebuilt, \$75 ea plus S&I; SMC-250 Carousel, IGM-20ARS, sequential, monophonic, all three cue tones, rebuilt, \$775 ea plus S&I. F Vobbe, GNBC, 419-228-4199.

Several cart machines for parts, BO. R Smith, WSHF, POB 3115, Valdosta GA 31604. 912-242-1636.

Spotmaster 505-B, Spotmaster 500-RP, Audi-Cord A-10, Tapecaster 700-P, all working when removed from service, \$200 ea/BO. R Smith, WSHF, POB 3115, Valdosta GA 31604. 912-242-1636.

Spotmaster 505-C loaded, mic pre-amp, aux tone, cue edit, gd cond, \$175 plus S&H. G Gibbs, KMNS, 901 Steuben St, Sioux City IA 51102. 712-239-3966.

Telex 36 cart deck, 4 trk head mono, w/auto trk switcher, rack mntg, brand new in box, \$100. E Davison, POB 7167, Springfield IL 62791. 217-787-0800.

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Audionics AV123-4TS 1/4 trk & Infonics RR-1 FT, Infonics RR-2 2 trk R-R duplicators, all in gd cond, sell all or part, \$200 ea. R Meyers, Benchmark Comm, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963, FAX 305-264-2357.

Recorder heads, used Scully mono & 2 trk, \$25-50, ATR100's, 3M M79-16 & 8's, Otari 1/2" 8 trks, \$495. W Gunn, 619-320-0728.

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16 trk 2", \$3450; Otari 1" 8 trk, \$2450; 5050 III-8, \$1950; Ampex ATR800 mono, \$750; Tascam 25-2, \$750; Tascam 52 mint, \$1200; MCI Locator III, \$1195; Ampex AG350 solid st elect, \$100/ch. W Gunn, 619-320-0728.

Otari Mark II-IV 1/2" 4-track, multi-track, mint, less than 50 hours, Best Offer. R Kaufman, Pams Productions, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

Ampex 1200 bias amps, mint from spares, \$125. F Long, Acme Soundworks, 221 W 26th St, NNYNY 10001. 212-647-1827.

Ampex 602 mono FT, gd cond, \$60 plus shpg. E Lightma, WEDL, 550 Merchant St, Ambridge PA 15003. 412-266-2802.

Nortronics CH3-R sensor type tape heads (8), \$10 ea or \$75/all prepaid UPS. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

Otari ARS-1000 w/tone sensor, plus second deck for parts, \$300/BO. K Carlson, KTFI, POB 2820, Twin Falls ID 83301. 208-733-3381.

Cipher Digital Softouch controller; (2) Cipher Digital Shadow II sync, all cables for Otari MX 55 TN & Otari MX 70. S Erickson, Erickson Audio Prod, Brooklyn NY 11238. 718-638-6810.

Fostex 80 8 trk w/remote, NR, manuals; Fostex 812 recdg console, phantom pwr, fader mute, 12 chnl x 8 buss, 3FX sends & 4 chnl digital headphone amp, \$2350/all. W Dougherty Jr, WLD Recdg Std, Music Valley Rt 1, Mill Spring MO 63952. 314-998-2681.

ITC 750 R-R in excel cond, \$350 ea; Ampex AG 440-B F-T, \$350; Wollensak 1500-SS R-R, \$50. D Lundy, Lundy Tape Duplicators, Cumberland Gap Pkwy, Keidrick KY 40949. 606-546-6650.

Teac 22-2 stereo R-R (2), 1/2 trk decks, \$250. D Matyis, KVET, 705 N Lamar, Austin TX 78703. 512-495-1300.

ITC 859-0005 Series 850 (2), R/P in roll around cab, one needs service, clean w/manuals, \$600/both. C Chamberlain, WUCO, POB 60, Bellefontaine OH 43311. 513-592-8606/644-1160.

Magnecord 728-4 1/4" x 10" R-R recorder, 7.5 & 15 ips, 2 track R-PB, 4 track PB, in portable case with all manuals, good condition, \$300 plus shpg. R Estes, Reel Recording, 11557 Sunshine Terr, Studio City CA 91604. 818-769-6569.

Nagra IV-5 w/mixer, reel adapter, battery eliminator, carrying case, BO. D Kilbert, KLSE, 735 Marquette Bank Blvd, Rochester MN 55904. 507-282-0910.

Otari CB-109 auto locators (3), \$200 ea; Metrotech dual deck slow speed logger system, \$300. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

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Otari MX 70 16 track with remote; Otari MX 55 TM ctr track time code with remote; Otari MX 5050 BII 1/4" 2 track with remote; (2) Studer B67 VU console recorders; Panasonic SV 3500 DAT; Panasonic SV 250 DAT; PCM 501/SL300 digital converter/Beta recorder; Nakimichi MR1, MR2 cassette, package pricing available. S Erickson, Erickson Audio Productions, Brooklyn NY 11238. 718-638-8610.

Studer A80 MK III-IV, full service/ops manual, \$50; Studer A820 VU, full service, ops & update documents & manual, \$50; Revox PR 99/B77 remote control in excel cond, \$70. R Cannata, Caritax, 2119 Fidler Ave, Long Bch CA 90015. 310-498-6492.

Otari MX-5050 8 trk in gd cond, new bearings, replaced heads, \$3400. G Desoto, Family Stations Inc, 290 Hegenberger Rd, Oakland CA 94621. 510-568-6200 X244.

Otari MX55 R-R, 2 trk w/rolling stand, low hrs, perfect, \$1500. A Jacobson, Work of Art Prod, 352 Maple St, W Hempstead NY 11552. 516-483-9086.

Otari w/automatic rewind (5) in excel cond, \$550/BO. R Coleman, WGEN, 1003 Oakwood, Geneseo IL 61254. 309-944-4633.

Parts for Ampex AG Series recorders, send for list, BO. S Daitch, Voice of America-MRS, Unit 24718, APO AE 09178.

Revox A-77 in vgc, \$250 plus S&H; Magnecord 1024, stereo, factory record w/little use, \$300 plus S&H. G Gibbs, KMNS, 901 Steuben St, Sioux City IA 51102. 712-239-3966.

Revox A-77, stereo w/rack mounts (3), can supply Conex 25 Hz detector for all three if all purchased, \$450 ea plus S&I. F Vobbe, GNBC, 419-228-4199.

Scully 288B 16 track rcdr with auto locator, new head stack, excel cond, \$4800; Scully 280B 2 track rcdr w/locator, excel cond, \$1050; Fostex 20 2 track rcdr, excel cond, \$250. MPC, POB 29381, Shreveport LA 71149. 318-636-0545.

Studer A-80 master recorder, gd shape but need heads, BO. B Cameron, WWKS, 1316 Seventh Ave, Beaver Falls PA 15010. 412-846-4100.

Revox PR-99 MK II stereo 2 trk play units (4) w/25 Hz sensor, still in boxes, \$850 ea, FOB Las Vegas. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

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Studer A807 2 track 1/4", meter over-bridge, built in monitor, with stand & remote, \$3800/BO. D McKinzie, McMix Prod Svcs, 406 Doris Dr, Woodstock GA 30188. 404-436-9620.

Tascam 122 in gd cond, \$275. J Addie, WLTL. 708-579-3749.

Tascam 22-2 (2), \$450 ea; Tascam 234 syncassette (2), \$700 & \$450; Teac X-300, \$375; Revox B-77 (2), \$600 & \$450. G Grassie, RNTC Broadcasting, POB 146, Dexter NM 88230. 505-734-5565.

Tascam 38 1/2" 8 trk rcdr w/8 chnl of dbx type I NR, \$1500 w/o dbx, \$1200. P Cibley, Cibley Music, 138 E 38 St, NNYNY 10016. 212-986-2219.

Tascam 85-16B 1" 16 trk with dbx in roll-around cabinet, mint condition. T Dupuy, Holbrook Media Productions, 108 Exchange Pl, Lafayette LA 70503. 318-234-3768.

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Teac X300, \$300/BO; Otari MX 5050 B11, \$1500, both in excel cond. M Grubbs, KATG, POB 1047, Luling TX 78648. 210-875-2555.

Telex 230 RP 85 preamp, 1-7/8 x 3-3/4 sp 1/2 trk mono in wood case, excellent thru-out, \$250. J Addison, Stowe Media, 171 Hartford Rd A-7, New Britain CT 06053.

Two portable R-R's, \$25 ea; 1978 LPB audio compressor/limiter, \$100; (2) AC voltage regulators, \$50 ea. J Wilsbach, WMSS, Middletown PA 17057. 717-948-9136.

Various drive motors, (3) Scully 270, UMC, Nidec, Ampex 440, negotiable. C Arnold, KIPR, 415 N McKinley #920, Little Rock AR 72205. 501-663-0092.

#### Want To Buy

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

Scully '100' recorders, record/play amplifiers, 8, 16, 24 track heads. Sequoia Electronics, 4646 Houndshaven Way, San Jose CA 95111. 408-363-1646.

American S505-2R4 Concertone, operating w/manual, w/all functions, reasonable, state asking price. J Addison, Stowe Media, 171 Hartford Rd A-7, New Britain CT 06053.

#### COMPUTERS

ATT PC 6300 1985 broadcast computer with 40 MG 5.5" drive, keyboard, monitor, manuals & software for traffic & billing for two stations, \$500/BO. B Christie, Grande Radio Group, POB 907, La Grande OR 97850. 503-963-4121.

NEC P6 24 pin dot matrix printer w/8 internal fonts & 5 unused ribbons, \$125. P Cibley, Cibley Music, 138 E 38 St, NNYNY 10016. 212-986-2219.

Racal Vadic VA1251GK modems (2), \$75 ea. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

### CONSOLES

#### Want To Sell

Russco Mono 505 rack mount, 5 channel, \$300; Ramko DC5AR 5 channel mono, \$300; Grommes Precision M15 6 channel mono tube type, \$275. J Parsons, Parsons Snd Srvc, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

Autogram Pacemaker 828 8 channel stereo, slide control, excellent condition, \$3500. R Michaels, KOFX, POB 7762, Amarillo TX 79114. 806-355-1044.

Consoles, \$500 & up. Financing available (OAC). Call Mark at 619-758-0888.

Ramko DC5AR 5 channel mixers, 14 available, very good condition, \$225 each. 916-334-9449.

Audionics 110-8 special 48 track plus dual foldback mixing board, as is, BO. U George, Ugly George Satellite, 840 8th Ave, NY NY 10019. 212-969-0240.

Broadcast Electronics BE-4M50A, new, never used, \$625. G Grassie, RNTC Bdcg, POB 146, Dexter NM 88230. 505-734-5565.

Cetec Audio Series 20 with 16 input modules, external power supply, service manuals, schematics & maint records, BO. D Homey, Grace Schools, 2440 W Bethany, Phoenix AZ 85017. 602-242-2010.

Eddor AM 400 4 chnl automatic mic mixer, \$125. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-258-6161.

Fostex 812 & 80 12x8x2 recording console with 8 track R-R & 4 channel head-phone amp, with phantom power, remotes, mute, solo, original carton & manuals, \$2350. W Dougherty Jr, WLD Recdg St, Music Valley Rt 1, Mill Spring MO 63952. 314-998-2681.

Gatesway M5133 mono tube console, w/3 mic preamps, works, sounds gd, \$300. L Nixon, Classic City Prod, 1094 Baxter St, Athens GA 30606. 706-613-6724.

Harris Stereo 80, very clean, no mods, 8 channel, \$750/BO; Harris Studioette 80, clean, no mods, 8 channel, \$350/Best Offer. K Carlson, KTFI, POB 2820, Twin Falls ID 83301. 208-733-3381.

McCurdy SS808A bdcg console, 10 chnl, 2 chnl have multi-input selectors, also has (3) spare pwr supplies, BO. M Jennings, Common Mode, 50 Northfield Ave, W Orange NJ 07052. 201-736-7191.

Penny & Giles 10 Kohm faders, limited number, fits most late model consoles w/4" travel, \$50 ea; Sparta-Cetec 3410 10 chnl stereo console, all Daven pots, w/spares & book, \$850 firm, you pay shpg. B Mayben, WRVR, 5904 Ridgeway Pkwy, Memphis TN 38120. 901-767-0104.

Ramko DC 8 MS 8 chnl stereo board, excellent condition & extras, \$650; Shure M-67 mixer, \$75. D Lundy, Lundy Tape Duplicators, Cumberland Gap Pkwy, Keidrick KY 40949. 606-546-6650.

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### CONSOLES...WTS

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**Ramsa WR-8118** 18x4x2x2, hi/lo shelving, mid sweep, mint cond w/Calzone ATA flight case, \$1800. F Long, Acme Soundworks, 221 W 26th St, NY NY 10001. 212-647-1827.

**RCA BA-7** mono/dual/stereo 10 chnl first five as mics, one output module needs repair, \$750 plus S&I via truck. F Vobbe, GNBC, 419-228-4199.

**RCA BC-14** rack mount mono 4 channel, 16 inputs, excellent condition, \$175 plus S&H. W Tinsley, Air-Checks USA, 1123 Holcomb St, Watertown NY 13601. 315-788-3549.

**RCA BC-8A** dual chnl, solid state, self contained, plug in modules, 30 inputs, 2 program outputs, cue/monitor amps, mono, \$600 plus S&H. G Gibbs, KMNS, 901 Steuben St, Sioux City IA 51102. 712-239-3966.

**Shure SE-30** mixer w/built-in gated compressor, 3 chnls balanced in/out plus aux, VU meter, AC/DC, vgc, \$125. Write: WB Haley, Recording F/T Blind, 1021 Millmont St, Charlottesville VA 22903.

**Tapco 6000** mixer w/reverb, 6x1, rough, was working, \$35. E Davison, POB 7167, Springfield IL 62791. 217-787-0800.

**Tascam M-15B** 16x8x18x2 console, mint cond. T Dupuy, Holbrook Media Prod, 108 Exchange Pl, Lafayette LA 70503. 318-234-3768.

**Tascam model 15** mixing console in excellent condition, \$2000. MPC, POB 29381, Shreveport LA 71149. 318-636-0545.

**Telfax TFX-131** 4 channel remote audio board with/without Astrolite 2636-G1 headsets, excellent condition, \$500/BO. R Fess, WLRB, 309-833-5561.

**Visual Electronics M2146** 7 channel stereo, 2 input each (2), channel, EQ, remote start button & more, working when removed, \$500 plus S&H or pick-up. C Chamberlain, WUCO, POB 69, Bellefontaine OH 43311. 513-592-8606/644-1160.

**Tascam M-30** 8 channel, 24 input 6, 4 output busses, stereo output, 3 band EQ, very good condition with manual, \$375/BO. G Kintz, WLG1, Rt 2 Box 69, Hemingway SC 29527. 803-555-2977.

### Want To Buy

**Tascam M-320B**, must be very clean, K Carlson, KTFI, POB 2820, Twin Falls ID 83301. 208-733-3381.

**UREI 1691/1681**, broken, dead, working models wanted for parts, we'll pay shipping, call with details & price, parts also wanted. Wil, WXAC, Reading PA 19612. 215-921-7545.

### DISCO & SOUND EQUIPMENT

### Want To Sell

**AKG R-25** remote control with cable & connector for BX-25 reverb unit, new, \$30; JBL D16R2405 replacement diaphragm for JBL 2405 slot tweeter, new in box, \$50. E O'Brien, Imperial Snd, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

**Brother MD1-40** MIDI sequencer w/3-1/2" floppy drive, stores up to 30 files; Anatek pocket sync FSK synchronizer, locks sequencer to tape, MIDI cables & docs included, \$200/both. C Yengst, WAWZ, Weston Canal Rd, Zarephath NJ 08890. 908-469-0991.

**Burwen DNF-1201** dynamic noise filter for phono records. E Davison, WNNS, POB 7167, Springfield IL 62791. 217-787-0800.

**Duntech Sovereigns 2001**, light oak, fine condition, \$6000/firm, local Miami pickup or buyer pays shipping & handling. Insight Productions, 305-866-6048.

**Fostex 3180** stereo spring reverb, rack mountable, 3 sec delay time, 24 mS pre-delay time, will swap for UREI Cooper Time Cube mdl 920-16. E O'Brien, Imperial Sound, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

**JBL 2204H** speakers (4), 12" mid 2 #2445 horns 2-2044H high mounted in 2 cabinets almost new, \$1500; JBL 5232 2-way electronic crossover, \$100. D Kocher, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18103.

**Soundtech US-15C**, pair of pro mobile DJ loudspeakers, 15" cast frame woofer with compression driver/cd horn, black carpeted cabinets with corner bumpers, steel grills & handles, 65 pounds each, new condition, \$200 ea. Doc, KPDK, Box 829, Bowman ND 58623. 701-523-3884.

**Roland D-20** keyboard sampler, \$700. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

### Want To Buy

Early RCA 15" coaxial loudspeakers, LC-1A/MI-11411A; also early Tannoy 15" drivers, one or more. R Rosenow, KTTS, POB 2180, Springfield MO 65801.

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**Alesis 3630** compressor/limiter, dual channel, new with warranty card, \$255. MPC, POB 29381, Shreveport LA 71149. 318-636-0545.

**Aphex 320** Compellor in excellent condition & Dominator in excellent condition, \$900/BO. J Silver, PS Communications, Box 2324, Chicago IL 60611. 312-280-1112.

**CRL SPF-300A** NRSC adapter, \$400; **SEC-400** 4 band compressor, \$1000. M Persons, KAGE, 752 Bluffview Circle, Winona MN 55987. 218-829-1326.

**dbx 150X type I** (16 channel); Dolby 361 with A cards (4). S Erickson, Erickson Audio Productions, Brooklyn NY 11238. 718-638-8610.

**EXR Corp** exciter, like new, cost 2K, sac \$275. F Virtue, Virtue Recording, 161 N Broad St, Philadelphia PA 19115. 215-763-2825.

**Optimod 8000A**, \$1500. R Michaels, KQFX, POB 7762, Amarillo TX 79114. 806-355-1044.

**Orban Optimod 8100**, working, still in service, available immediately, \$3000/Best Offer. B Erlandson, KIXX, Watertown SD 57201. 605-886-8444.

**CBS 410 FM** Volumax (2), \$50 each; dbx 140, \$25; dbx 142, \$25; Optimod 8100 card SCA filter cards 8100-AFC (2), \$100 each. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

### MICROPHONES

### Want To Sell

**AKG D-202E** 2 element mic, like new, \$120. D Kocher, Digital Snd Makers, 1901 Hanover Ave, Allentown PA 18103.

**Gefell Neumann UM57** tube mics, New capsules for SM2 & many others, New AC701 tubes for Neumann mics, \$275. W Gunn, 619-320-0728.

**Electro-Voice RE16**, \$250; **Altec 626A**, call for price; **Sennheiser MD 421**, \$325; **Sony ECM-50**, \$175. Berler Communications, Russ Spice, 708-263-6400.

**AKG 414's**, \$695, original D12 like the Beatles used, \$295, Sony ECM54, \$150, Beyer M500 1k new, \$300, Demeter 4-ch tube DI rack mt lk new, \$875. W Gunn, 619-320-0728.

**EV 103** like 635A, good condition, XLR mount, many available, \$35 each. U George, Ugly George Satellite, 840 8th Ave, NY NY 10019. 212-969-0240.

**Neumann KM-86** 3 pattern condenser mic, mint, \$650; **EV CO 90** lavalier condenser mic, \$55. D Lundy, Lundy Tape Duplicators, Cumberland Gap Pkwy, Keidrick KY 40949. 606-546-6650.

**Neumann U-67** excellent condition with power supply, \$2455; **Sony C-35P (2)**, new with power supply, \$500/pair. F Virtue, Virtue Recording, 161 N Broad St, Philadelphia PA 19115. 215-763-2825.

**Sennheiser 441**, new w/all papers & response curves, \$425. R Payne, 313-786-1767.

**Trade RCA 77-D** ribbon mic for new EV RE-27, RCA mic working & has complete yoke, would prefer RE-27 complete w/shock mount & arm. T Heathwood, Heritage Radio, POB 16, Boston MA 02167. 617-969-9966.

**Vega R-33-77 DII**, \$895; **R42-77DII**, \$1300, wireless microphones in excel cond. Don, Scales Film Sound, 3142 Market Pl, Bloomington IN 47403. 812-339-4446.

### Want To Buy

**77-DX's, 44-BX's, KU-3A's** On-Air lights. Top price paid. Fast response. Bill Bryant Mgmt, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131.

**RCA 77DX/44BXs** ribbon, chrome/TV grey, gd cond, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

### MISCELLANEOUS

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Ampex, RCA and EV equipment, recorders, turntables, mics, hundreds of parts, huge inventory absolutely must be sold. Call for list. Bob Lindahl, 503-644-9643.

**Rotron Blowers** for Elcom, Harris, CCA, CSI, McMortin, rebuilt & new. Goodrich Enterprises Inc. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

Anvil rack case, 16 space, 18" deep, \$200/BO. G Kintz, WLG1, Rt 2 Box 69, Hemingway SC 29527. 803-555-2977.

Aphex 250 type III aural exciter, new condition, '93 model, all papers, invoice, manual etc, original carton, sacrifice at \$695. J Masters Yung, Ariel, 140A Bellevue Ave #5, Newport RI 02840. 401-846-9743.

Audio & RF tech manuals for Sparta equipment, write for list; New & like new audio transformers, write for list & prices. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

Magnatek 223-3212 Jefferson Electric dry transformers (2 ea), input 240V Delta, out 208V WYE, \$700 plus shpg. D Morgan, KJYE, 1360 E Sherwood Dr, Grand Jct CO 81501. 303-241-9230.

Northern Technologies TCS-LAPE surge suppressor, 240V, 3 phase Delta configuration, 3 years old, great condition, \$700 plus shipping. D Morgan, KJYE, 1360 E Sherwood Dr, Grand Jct CO 81501. 303-241-9230.

Onan 5 kW pwr gen, natural gas or propane, used only 4 hrs, will sacrifice at \$2200. C Arnold, KIPR, 415 N McKinley #920, Little Rock AR 72205. 501-663-0092.

Perma pwr AC line cond RV-250 (2), \$50 ea; Onan KM1P1A 2 kW AC gen, \$200; new sealed 1000' roll Belden 9011 RG-11, \$150. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

Phasemaster T-10,000 phase conversion unit, working when removed, \$1K. G Arroyo, WONQ, 1033 E Semoran Blvd #A, Summit Plaza Casselberry FL 32707. 407-830-0800.

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Powerstat 136-B variable power transformer, new in box, \$75 plus S&H. W Tinsley, Air-Checks USA, 1123 Holcomb St, Watertown NY 13601. 315-788-3549.

Rack mount for Shure M67 mixer, \$18 prepaid UPS. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

Topaz AC line regulator, 50 KVA, 3 phase 208Y/120; Topaz isolation transformer, 45 KVA 3 phase 208Y/120. T Wortmann, WSAG, 309 Braasch, Norfolk NE 68701. 402-371-0780.

Superior Electric Stabaline power conditioner, handles up to 8.33A, \$135; Lil Miss Moffat 48 volt phantom power supply, 2 @ \$20 ea; (2) new 6' rack rails, \$20 ea, other size pieces available free with purchase, all items plus shipping. B Lord, Lord Broadcasting, 13313 SE 208th St, Kent WA 98042. 206-631-2374.

Up timers (2), new, 2" readouts, counts to 9:59 & resets, momentary closure resets unit to 0:00, \$65 ea, postpaid. D Peluso, KJUL, 2880 E Flamingo Rd #E, Las Vegas NV 89121. 702-732-2200.

Western Electric 111-C coil, \$30. WC Florian, WNIB, 1140 W Erie St, Chicago IL 60622. 312-633-9700.

## Want To Buy

Tube output transformers by UTC, Triad, Freed, WE, Acrosound, Peerless. L Blackmon, RQ Studio, Lawson Rd #4, N Reading MA 01864. 508-664-0174.

Radio transformers by Chicago, UTC, Triad, Peerless, Freed, Sola, send list. J Gangwer, 942 32nd St, Richmond CA 94804. 415-644-2363.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NNY 10003. 212-674-3060.

Ampex tube recorders and mixers. W Gunn, 619-320-0728.

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RCA BW-50 freq & mod mon, standard 10 kHz US spacing 530 to 1800 kHz, calibration verified 8/2/93, \$550 plus S&I via UPS. F Vobbe, GNBC, 419-228-4199.

## Want To Buy

McMartin (buy & sell) any model. C Goodrich, 11435 Manderson, Omaha NE 68164. 402-493-1886 or fax 402-493-6821.

## RECEIVERS &amp; TRANSCEIVERS

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Professional SCA demod card with excellent crosstalk rejection, \$20; Superadio III with SCA, \$85, performance guaranteed 1-800-944-0630.

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Burk TC-8 w/dial up speech SCA gen comp set, like new, \$1999; Burk TC-8 remote control studio unit, like new, \$750. J Fuller, WJFF, 26 Woody Hill Rd, Hope Valley RI 02832. 401-539-8502.

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Audio/Video Consultants

Burk TC8 remote control system w/SCA modems, excel cond w/manuals, \$1500/BO. M Lightner, WPRR, 2727 W Albert Dr, Altoona PA 16602. 814-944-9456.

Data Service Unit (DSU), 4 wire switched 56, rack mount mdl 1056R, \$745. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-258-6161.

Decibel Products DB-420 vertical antenna, type N male on pig-tail, vgc, \$450 plus S&I via truck. F Vobbe, GNBC, 419-228-4199.

Gentner digital hybrid w/ANA upgrade; Telemix 10 w/switch console. R Lide, Jim Gibbons Radio, POB 151, Frederick MD 21705. 301-663-4181.

Gentner SPH-3 analog telephone hybrid, excel cond, \$300. P Bammerlin, WRQK, 4111 Martindale Rd, Canton OH 44705. 216-492-5630.

Mart & TFT CR-10 RPU & 7705 rcrs only, mono, \$500 ea/BO. M Grubbs, KATG, POB 1047, Luling TX 78648. 210-875-2555.

Mart STL-10 stereo 2TX & 2RX, \$4000. R Michaels, KQFX, POB 7762, Amarillo TX 79114. 806-355-1044.

Symetrix Ti-101 hybrid telephone interface, excellent condition, \$300. M Vanhooser, KSKY, 4144 N Central Exp #266, Dallas TX 75204. 214-827-5759.

TFT 8300 receiver auto switcher panel mdl 7773, \$325. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

## Want To Buy

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Wish to rent a remote van radio studio during remodeling. J Stitt, WCIN, 106 Glenwood Ave, Cincinnati OH 45217. 513-281-7180.

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Micro Phase MP2030-S Cubs baseball receiver, \$1100; Wegener 10767A CNN Headline News Unistar receiver, \$1900. M Rollings, WZNF, 400 Broadway, Urbana IL 61801. 314-458-5595.

Wegener 1601 mainframe with 1683 & 1621 cards with Crystal Systems GLR 75 receive, \$1150. J Katz, KJUG, 396 Buckley Rd, San Luis Obispo CA 93401. 805-541-8798.

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ITT 1735D 17" oscilloscope with manual, needs work, clean, Best Offer. R Meyers, Benchmark Communications, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963, FAX 305-264-2357.

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Collins A-830-2 10 W tube exciter & 786M-1 stereo gen, needs minor work, \$400/BO. L Nixon, Classic City Prod, 1094 Baxter St, Athens GA 30606. 706-613-6724.

CSI T-1-F 1 kW transmitter, excellent condition, \$6100; CSI exciter, 20 W, good condition, \$1450; Orban 8000A stereo/generator proc in good condition, \$1695; Marti RMC2-AXT(A), RMC2-AXT(10) needs repair, \$350; (4) 575 mercury vapor rectifier tubes, condition unknown, \$40; Ampex 351 PB rack mount decks (2), \$300 ea; Marti SCG-67, \$165; Gates GTM88F frequency monitor, \$145; Eico 435 scope, condition unknown, \$45. C Sigmon, WZDK, POB 1398, York SC 29745. 803-684-4241.

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FM 2 kW, 3 kW or more & exciter at 103.3, mono okay, must be in good working condition, fax info to C Tiemann, WAIV, Box 103, Spring Valley IL 61362. 815-663-0103.

Gates TE-1 exciter needed for parts, any cond considered. R Lide, Jim Gibbons Radio, POB 151, Frederick MD 21705. 301-663-4181.

Harris 20 kW. W Wilson, KJTY, 1005 SW 10th Ave, Topeka KS 66604. 913-357-8888.

Late model 5 kW AM in good condition, Harris MW5/SX-5 or equivalent preferred, send photo, desc & price first letter. J Stitt, WCIN, 106 Glenwood Ave, Cincinnati OH 45217. 513-281-7180.

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High school radio station in Ohio looking for tax deductible donation of 1 kW transmitter or amp, will pay shpg or pick-up. B Long, WSTB, 1900 Annalane Dr, Streetsboro OH 44241. 216-626-4906.

Reading Service for the visually & physically impaired in need of automation system, studio equip & other bdcet equip for non-commercial FM, non-profit 501(c)3, organization will provide letter of receipt. E Harper, 901-427-8000.

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Panamic audio spectrum analyser & (2) supersonic audio spectrum analysers, BO. R Meyers, Benchmark Comm, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963, FAX 305-264-2357.

Potomac AT-51 audio test set in good condition, \$2500. M Hendrickson, Hedberg Broadcasting Group, POB 249, Blue Earth MN 56013. 507-526-4044.

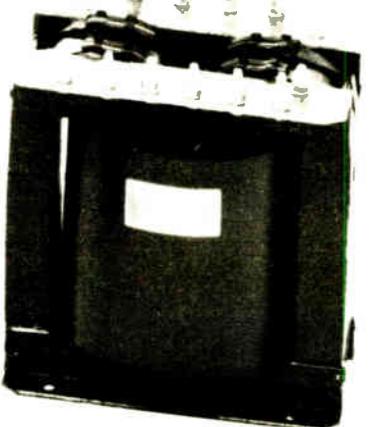
Technical Materials Corp 5 kW dummy load, convection cooled, 50 ohms, up to 30 MHz in 6' high by 4' wide by 2.5' deep ventilated weather proof fiberglass cabinet, new, \$1000/BO. R Meyers, Benchmark Comm, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963, FAX 305-264-2357.

Sealed Bid Sale of test equip, bid opening Dec 15, 1993. For descriptions & bid form send S.A.S.E. to: Test Equipment Sale, Benchmark Comm Corp, 4700 SW 75 Ave, Miami FL 33155.

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JVC 4-DD-5 CD-4 quadrophonic disc demodulator, low hrs, \$85/BO. D Pulwers, Dave's Price Audio Prod, 310 N Howard St #103, Alexandria VA 22304. 703-751-9346.

JVC 4-DD-5 CD-4 disc demodulator, low hrs, \$80/BO. D Pulwers, Dave's Price Audio Prod, 310 N Howard St #103, Alexandria VA 22304. 703-751-9346.

Technics SM-10-B3 bases for SP-10 TT's (2), \$100 ea; Technics base for SP-25, \$50. C Hall, WJMN, 235 Bear Hill Rd, Waltham MA 02154. 617-290-0009.

**Want To Buy**

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Russco Studio Pro replacement toner arms, need two ASAP. D Belson, WCPR, Box S-1461, Hoboken NJ 07030. 201-216-3484.

WE 9A reproducer group, cartridges, repeat coils, arms, EQ's. L Blackmon, RQ Studio, Lawson Rd #4, N Reading MA 01864. 508-664-0174.

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I would like to receive or continue receiving Radio World FREE each month.  
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A. Commercial AM station  
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G. TV station/teleprod facility  
H. Consultant/ind engineer  
I. Mfg. distributor or dealer  
J. Other \_\_\_\_\_

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B. General management  
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D. Programming/production

G. Sales Manager  
E. News operations  
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Associate Publisher .....Carmel King  
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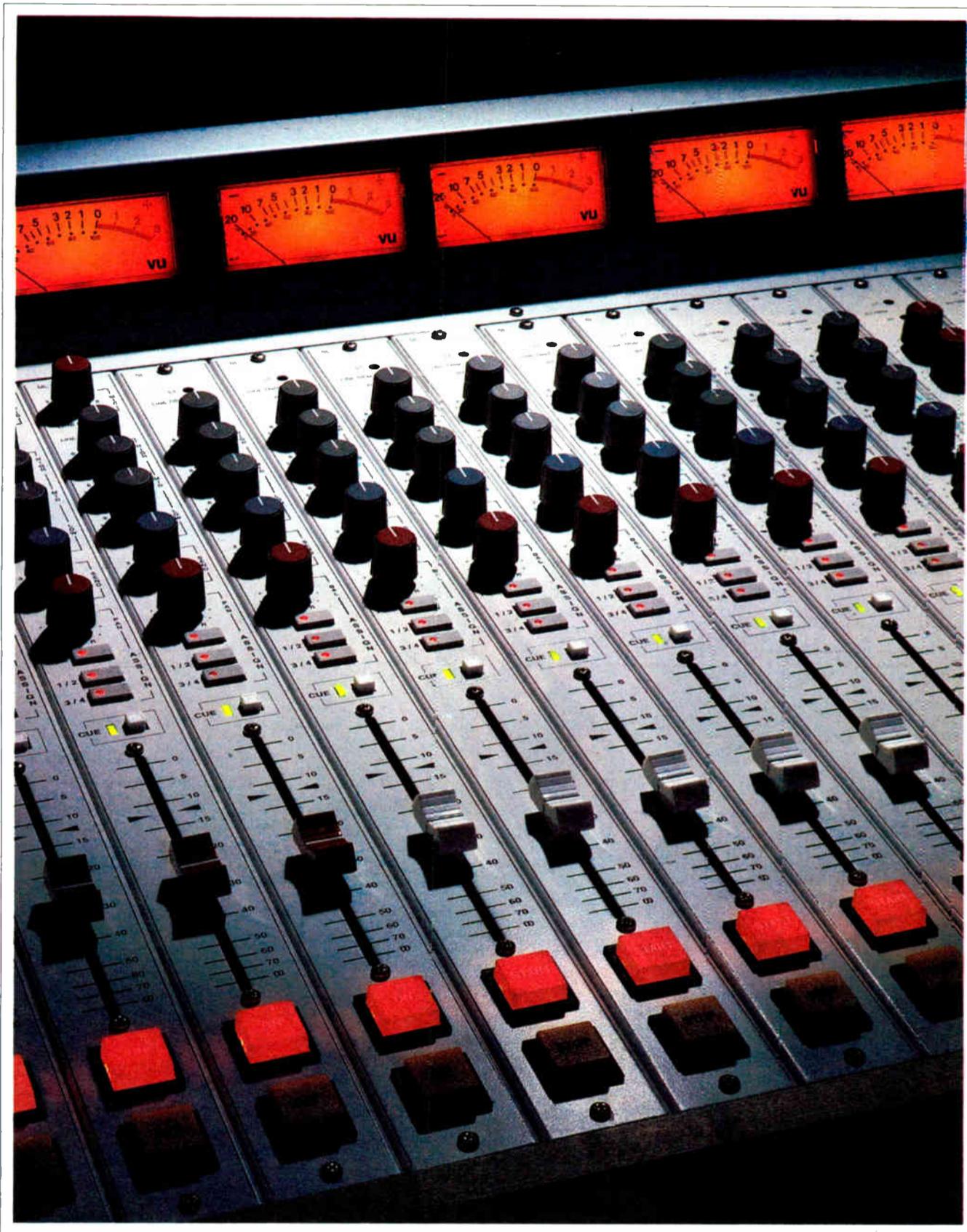
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\*Closing for listings is the first and third Fridays for the next month's issue.  
All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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# Just R I G H T !



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**A-300**

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