

*****3-DIGIT 857
S117298 DOB 9502
TOM MILLER
ASST CE
KTZR
2033 S AUGUSTA PL
TUCSON AZ 85710 7905



Complete AES Coverage See pp. 14-22

Radio World

Vol 19, No 23

Radio's Best Read Newspaper

November 15, 1995

AMs Swapped In Seattle

by Bob Rusk

SEATTLE Two AM stations in the nation's 13th largest market have switched frequencies in a deal both call a "win-win" transaction. KNWX, which had been at 1090 on the dial, has moved to 770, taking over the position held by KRPM, now heard on 1090.



With the move, KNWX is adjacent to its sister AM station. Heritage Media-owned KRPM gets 50 kW both day and night in the swap.

continued on page 3 ▶



FCC Extends Deadline For EAS Implementation

by Lynn Meadows

WASHINGTON Bowing to industry pressure, the Federal Communications Commission (FCC) extended the deadline for Emergency Alert System implementation to Jan. 1, 1997.

The commission released a Memorandum Opinion and Order last month resolving five petitions for reconsideration that tagged along behind the original Report and Order on EAS issued last November.

The original July 1, 1996, implementation deadline was extended thanks to a petition from the National Association of Broadcasters (NAB) who argued that the earlier date did not provide enough time for broadcasters to make the switch.

RBDS and EAS

The commission denied petitions regarding the use of RBDS with EAS. In its original rule, the FCC had encouraged but did not require broadcasters to use RBDS in the new emergency system.

"RBDS has always been an option," said Frank Lucia, acting chief of EAS for the FCC.

In petitions, Sage Alerting Systems Inc., Federal Signal Corp., and Delco Electronics Corp. asked the FCC to provide more specifics to FM broadcasters who will be using RBDS with their EAS systems.

Their petitions concerned requiring the use of specific alarm codes for RBDS and special codes to allow RBDS to synchronize with FM stations transmitting emergency warnings.

Also included in those petitions was a request that when sending an EAS warning, stations using RBDS be allowed to increase both the percent of FM station modulation from their subcarriers and their total radio modulation.

Petitions opposed

The NAB opposed the RBDS petitions warning commissioners that because the RBDS is a voluntary standard, incorporating the current version into the rules for EAS would hurt its development.

Data Broadcasting Corp., however, which uses subcarriers to send information like stock quotes, asked the FCC not to encourage the use of RBDS with EAS at all. DBC said that the 57 kHz signal could interfere with the data information service it provides on a different subcarrier.

In the mandate, the FCC agreed with the NAB on RBDS.

"We see no reason for regulatory intervention in this developmental process." The commission added that it wanted to allow FM operators "maximum flexibility" in operating their subcarriers.

continued on page 19 ▶

SBE Mission to Provide 'Tools' for Engineers

MILWAUKEE There are at least three Cs in broadcast engineering for newly-elected SBE president Terrence (Terry) Baun: convergence, communication, and change.

Baun is principal of Criterion Broadcast Services which provides technical support services to radio stations in the upper Midwest. He has been active in the Society of Broadcast Engineers for almost 20 years holding offices in the Milwaukee chapter and serving two terms as national vice president.

Growth and education

Along with promoting fellowship and a sense of camaraderie, Baun said the primary purpose of the organization is the professional growth and education of the membership.

"I think that's one of the things that obviously is paramount right now. We need to help provide the tools that our members need to make them successful

in their business. That's really what we're all about is providing the tools."

Convergence

Baun said the biggest challenge for broadcasters in the future is convergence.

"What is really happening here is we are seeing that what we formerly thought of as little boxes — in other words here we have the radio business, here we have the television business, and here we have the PC and the electronic business" — are coming together very quickly, he said.

He used radio stations with web pages as an example. "That is just an incredible kind of jump for an oral medium to all of a sudden decide that it is important for them to have an electronic presence on the electronic network - on the World Wide Web."

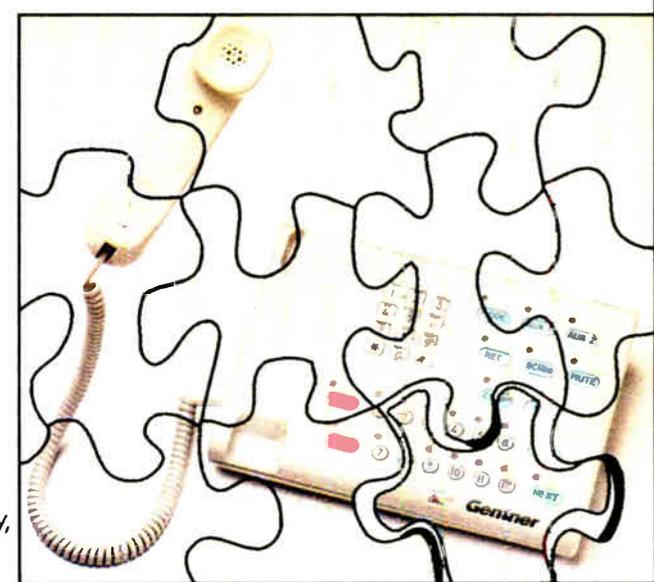
"Everything seems to be coming together and that convergence is providing tremendous opportunities but it is also

continued on page 6 ▶

The Talk Show Puzzle Has Been Solved!

The new **Gentner TS612 DCT** answers the puzzling question: "How do I make a good talk show GREAT?"

This easy-to-install and operate talk show phone system includes two built-in Gentner Superhybrids, digital audio enhancement, automatic level control and up to 12 standard analog lines. Plus, many, many more features.



Still puzzled about how this system can fit into your budget while making your life easier? Call Harris Allied to find out how easy the missing piece will fit into your studio.

Phone: 800-622-0022
Fax: 317-966-0623



Circle (15) On Reader Service Card

NEWSWATCH

Engineering Awards

WASHINGTON The National Association of Broadcasters (NAB) is seeking nominations for the 1996 Television and Radio Engineering Achievement Awards. Nominations must be received by Dec. 5.

The awards recognize individuals in radio and TV for outstanding contributions to the broadcast industry. Engineers can be nominated for anything that warrants recognition such as inventions, new techniques, dissemination of technical knowledge and literature or leadership in broadcast engineering affairs.

Nomination forms and requirements are available by calling Sandra Schultz at 202-429-5346.

Station Ownership

NEW YORK The M Street Database reported statistics on group ownership versus non-group ownership of radio stations in the U.S., as well as information on stand alone stations.

All licensed stations and construction permits that have been assigned call letters were used in the tabulations — 12,754 stations total.

According to the statistics, group owned

stations make up 40 percent of the total with 42 percent of these stations being FM stations. Of the 60 percent of non-group owned stations, 62 percent are AM stations.

The statistics show that 43 percent of all stations are stand alones and within this group 63 percent are FM stations.

The M Street Database defined groups as those who own more than one station in more than one market. Combos/duopoly in a single market are not a group. M Street defined a stand alone as a station with no AM or FM sister stations. Each is one station in one city which could be group or non-group owned.

Evergreen Media to Acquire WKLB-FM Boston

IRVING, Texas Evergreen Media

Corp. announced that it has signed an agreement to acquire WKLB-FM in Boston from Fairbanks Communications Inc. for \$34 million in cash.

"With the addition of WKLB, Evergreen will be the nation's third largest radio broadcaster as measured by both revenues and broadcast cash flow," said Chairman and CEO of Evergreen Media, Scott K. Ginsburg.

The acquisition of WKLB-FM would result in Evergreen controlling a total of 24 FM stations with three in the Boston market. If deregulatory legislation does not pass, Evergreen will have to divest certain stations and/or seek waivers in order to meet the FCC's multiple ownership rules.

CCA Electronics Offers Service School

ATLANTA CCA Electronics will hold their next semi-annual service school at their plant facilities in Atlanta on Jan. 18-20, 1996.

The school will cover installation, operation, service, trouble shooting and repair of CCA's line of FM broadcast transmitters.

continued on next page ►

Take a LOOK at THIS:



Then look at our competition.

OF COURSE many stations are cost-conscious these days—just remember why you wanted a new console in the first place: to **UPGRADE**.

The R-60 has what's needed, with all the right features: our **SIMPLE PHONE**® module for easy error-free talk segments; twin six bank preselectors, so you won't run out of input capacity; onboard machine control panel, clock, timer, a well-designed cue system, and a truly effective control room and studio monitor interface. And because it's totally modular, service is easy—even while you're on-the-air! Documentation: this can determine whether you have an installation day or an installation *week*. We've done it right to guide you through. And **PERFORMANCE**? Of course we've handled that; simply compare our specs.

DON'T MISS your opportunity to upgrade. Choose the R-60 radio console from **AUDIOARTS**.

FREQUENCY RESPONSE	
Line (10Hz-20KHz)	±1/10dB
Mic (20Hz-20KHz)	±1/10dB
THD+N (20Hz-20KHz)	
Line, +4dBu	.005%
Mic & Line, +16dBu	.005%
IMD (SMPTE)	
Mic & Line, +4dBu	.004%
DIM	
Mic & Line, +16dBu	.005%
DYNAMIC RANGE	
Line	114dB
Mic	98dB
HEADROOM	
ref +4dBu	24dB
OFF & ASSIGN ISOLATION	
1 KHz	-110dB
20 KHz	-105dB
BUS CROSSTALK	
1 KHz	-100dB
20 KHz	-75dB

7305 Performance Drive, Syracuse, NY 13212
tel 315-452-5000 / fax 315-452-0160
E-mail: Wheatstone@aol.com



AUDIOARTS' ENGINEERING

Index

AES COVERAGE

Tubes Talk of the Town at AES Show	
by Ty Ford	14
New Mic Technology at AES Show	
by Ty Ford	16
Innovative Audio for Radio in New York	
by Alan R. Peterson	19

RUNNING RADIO

David Brenner Jumps into Talk Radio	
by Alan Haber	25
Revolutionize Radio Advertising	
by Ty Ford	28
Rush Limbaugh Loses Initial Legal Battle	
by Lynn Meadows	30
Comedy Duo Benefits Early Radio	
by Bob Rusk	35
Solving Crises with Team Management	
by Sue Jones	37

Irreverence, Intrigue, Ingenuity on the Net

by Alan Haber 38

Is Logo Redesign Really Necessary?

by Mark Lapidus 45

RUNNING RADIO

Workbench	
by John Bisset	47
Peak Performance from Analog Recorders	
by Tom Vernon	48
Microcontrollers for the Station	
by Jim Somich	51
'Doc' Herrold and His Arc-Fone	
by Barry Mishkind	52

Registration is \$250 and includes a complete operating manual for any CCA transmitter as well as lunch each day.

Attendance is limited to the first 25 applications. Contact Kerstin Benton for details at 404-964-3530 or fax 404-964-2222.

Eastern Broadcast Expo '95 Focuses on Change

ORLANDO, Fla. Changes taking place in the broadcast industry will be the focus of Eastern Broadcast Expo '95 being held Dec. 7-10, 1995 at the Walt Disney World Dolphin Hotel.

Seminars and exhibits will concentrate on the effects of the Telecommunications Act of 1995 and the convergence of TV, radio, computer, telephone, software, entertainment and cable industries.

Management seminars on the Telecommunications Act of 1995 and its impact on local radio and TV stations will be presented by industry CEOs and government leaders.

The Television Bureau of Advertising and the Radio Advertising Bureau will present sales tracks for maximizing revenues in the changing world of broadcasting.

Engineering seminars by the Society of Broadcast Engineers will focus on new technology and its effect on companies' bottom lines.

Consumer Electronics Manufacturers Association Emerges

SCOTTSDALE, Ariz. The Electronic Industries Association's (EIA) Board of Governors promoted its Consumer Electronics Group to sectoral status and changed its name to the Consumer Electronics Manufacturers Association (CEMA).

Joining the Telecommunications Industry Association as an industry sector of EIA, CEMA represents U.S. manufacturers of audio, video, home office, mobile electronics, multimedia and accessories and produces the Consumer Electronics Shows.

"This name change reflects the importance of the consumer electronics industry and its relatively unknown but significant manufacturing presence in the United States. With over 170,000 employees spread out over hundreds of factories, consumer electronics is...an important feature in the U.S. economy," said CEMA Board of Directors Chairman Joe Clayton.

Degrees in Broadcasting

BOSTON The Northeast Broadcasting School received permission from the Commonwealth of Massachusetts' Higher Education Coordinating Council to confer associate degrees in broadcasting and recording arts and to change its name to the Northeast College of Communications.

The average enrollment of the trade school, which offered one-year certificates in radio and TV broadcasting and recording arts, averaged approximately 300 students per year. College President Howard E. Horton expects enrollments initially to increase by at least 10 percent.

The College will continue to offer the one-year certificate program in addition to associate degrees. ☉

AMs Swapped in Seattle

► continued from page 1

simulcasting the "Kickin' Country" format of sister KRPM-FM. According to Paul Fiddick, Heritage Media radio group president, "This deal goes back to 1988, when we bought the 770 AM signal. We acquired a construction permit allowing the station to go from 1,000 watts to 50,000 watts."

Heritage had a difficult time finding a

KIRO NEWSRADIO

710AM

tower site, however, with zoning restrictions and interference concerns to deal with. After two years, the company reached an agreement with King Broadcasting to diplex on King's 1090 AM towers.

"An important part of the deal," explains Fiddick, "was an agreement that in return for letting us lease space on their towers, King had the right to swap frequencies with us if they found our new signal was better than their signal at 1090."

King ultimately sold 1090 AM to Bonneville International. Bonneville was eager to move the station to 770, next to the company's long-dominant property in Seattle, KIRO 710 AM.

Some listeners in suburbs east and south of the city have a difficult time hearing the 1090 AM signal at night. XEPRS, which sends its 50 kW signal north from Mexico, interferes with it.

Heritage Media looked closely at that, but according to KRPM operations manager Ray Randall, "Having 50,000 watts was more important to us than some of the coverage we might lose."

"We had been broadcasting the Tacoma Rockets (hockey team) and wanted to cover far enough south to keep them happy. But when they moved to Canada that became a moot point."

The stations switched frequencies on Sept. 16, at 12:01 a.m. KNWX rolled out an all-news format, complementing the separate programming at news-talk KIRO.

"To protect KIRO and its well-established image," said news director Dennis Kelly, "we created the all news format to prevent a competitor from taking that formatting tack." KNWX is the market's only 24-hour-a-day all news outlet.

"The feedback has been positive," said Kelly.

"A lot of people felt Seattle was ready for an all-news station, primarily based on the fact that the city now has the fourth worst traffic problem in America.

"In the middays it had been difficult to find a traffic update on radio. We're the only station during that period offering updates every 10 minutes." The station broadcasts live updates from 5:00 a.m. - 11:00 p.m.

Several KIRO staffers do double duty on KNWX. KIRO/KNWX program director Tom Clendening does not feel this is a drawback, though. "It definitely eliminates the boring periods," he says with a chuckle. "You just have to try and accomplish more in the same amount of hours every day. We see this as giving us a lot of great products to offer to listeners and advertisers."

The sales staff not only represents KNWX/KIRO, as well as KIRO-FM, but also the Mariners baseball and Seahawks football networks (KIRO is the flagship station for both networks). Bonneville took over KNWX in February, but did

not begin a TV and bus marketing campaign until October, after the switch to 770 was complete. KNWX has 50 kW during the day and 5 kW at night.

Both the 770 and 1090 frequencies have a rich history in Seattle, going on the air in 1925 and 1927, respectively. The original call letters on 770 AM were KXA, used until the 1980s. Up to that time the station's "T" antenna was a landmark downtown, with a longwire strung between two towers.

KING, named after King County, were the call letters on 1090 AM. It was the flagship station of King Broadcasting and remained a dominant station throughout the 1970s, with a top 40 format.

In recent years, KING programmed news and talk. When Bonneville purchased the station, the company decided that along with the frequency change, it would apply for new call letters.

"KNWX has such a powerful sound," said Kelly, who worked at KING from 1983 - 1987. "KNWX looks like 'news.'"

KNWX is an affiliate of AP News and runs the network overnight. AP Business and sports reports are also carried during the day. "Outside of that," Kelly adds, "everything is done by our local news anchors. Much of what we're doing is working in the tried-and-true fashion of the CBS and Group W all-news-stations." KNWX uses a variation of the Group W slogan, saying, "Give us 30 minutes and we'll give you the world."

Even though KIRO and KNWX air

similar formats, Kelly says there is room for both stations.

"Through our research," he explains, "we feel there won't be an adverse impact on KIRO, because that station has so many of the personality aspects of radio. KNWX is a utility-driven product. Listeners tune in to KNWX just for the information. The approach is, "just the facts."

"We feel this is a product that was bound to come to the market. All news is a new format here, but we feel it will become a household name in Seattle."

According to Fiddick of Heritage Media, his company spent "between one million and two million dollars" to convert the AM 770 station from 1 kW to 50 kW, which was the only financial element of the frequency switch.

Fiddick points out that "the money we

ALL NEWS
770
KNWX

spent was far less than what it would have cost to construct our own tower site. Even with the frequency swap, the signal we now have for KRPM is much better than what we could have built for ourselves.

"We are very happy with the swap. The 50,000 watts is far better than the 1,000 we started out with at 770," said KRPM General Manager John Rogers. "It's the difference between night and day." ☉

Who do you call when you're ready for Codecs?

Radio broadcasters call us from all points on the globe when they have questions on radio remotes, STL or Studio-to-Studio links using SW56 and ISDN. Why? Years of experience, an unblemished reputation for integrity and objectivity plus the broadest line of codecs and technology - including the lowest-cost, full bandwidth systems available.

With G.722 and apt-x to the widely-used ISO/MPEG Layer II algorithm, we can provide you with the best-sounding, most cost-effective and ruggedly built solution for your application.

Call or fax to take advantage of our additional support:

- Comrex ACCESS - application-based newsletter
- Fax-on-Demand-extensive library of technical and applications information
- Comrex Users' Forum Network on CompuServe
- Comrex Handbook on "Digital Telephony"

You may have heard that codec remotes are "as easy as" When you find it's not quite that simple, we're just a toll-free call from anywhere. You'll get the kind of support you didn't think was still possible - knowledgeable, direct and personal. Ask any Comrex customer.

U.S. 1-800-237-1776

UK 0 800 96-2093

Europe: Request your free Comrex calling card.



COMREX®

Comrex Corporation, 65 Nonset Path, Acton, MA 01720
508-263-1800 • Fax-on-Demand 508-264-9973 • Fax: 508-635-0401

Circle (150) On Reader Service Card

Longevity Elusive in Broadcasting

WASHINGTON The first order of business is to introduce you to Sandra (Sandy) L. Harvey-Coleman. Sandy joined us Nov. 13 as Midwest sales representative after operating an in-house ad agency for Roy M. Ridge, Allied Broadcast, and then as manager, worldwide advertising for Harris Allied's broadcast division.

Sandy brings more than nine years experience in the radio broadcast industry.



Sandra L. Harvey-Coleman

Prior to joining Allied, she was an advertising artist for a Gannett newspaper, a free-lance artist and, along the way, has held various positions in sales management.

Sandy can be reached at 317-966-0669; fax: 317-966-3289; or write her here, care of RW Sales Manager Skip Tash.

★ ★ ★

Longevity is not an easily attainable goal in the broadcast business. On the engineering side, not only is it hard to attain, but one moment of carelessness or one ill-conceived notion can ruin a reputation that took years to build. Or not even ruin, but slightly sully, perhaps.

OK, what am I babbling about? It seems that a certain high-profile contract engineering firm is mass mailing direct mail pieces to some highly-ranked radio stations' sales and general managers. Come again? To the sales managers?

It seems that this firm is suggesting to these sales and general managers that perhaps their own engineers are less than professional. And don't they want to hire



a first-rate contracting firm? I realize that business is tough these days, but stabbing your engineer colleagues in the back in an effort to drum up business is not the way to operate.

What's more, if, as has been the case at some high profile stations around here, the sales and general managers go to their engineers and ask "Who is this and what do they want from us?" the firm in question is going to appear unprofessional and untrustworthy to all.

If the effort was merely a mass mailing, then the firm looks stupid for not qualifying its leads a little better.

I know — it is a dog-eat-dog world out there — but chances are you'll have a better shot at professional longevity if you excel at your chosen profession and leave the backstabbing to others.

★ ★ ★

Now for some fun news. The well-known broadcast team of Lorianne Crook and Charlie Chase will premiere in national syndication with "The Crook and Chase Country Countdown." Beginning January 1996, Jones

Satellite Networks will offer the four-hour countdown program to radio stations across the United States, and as I write this, is beginning its exclusive distribution efforts.

The program will feature exclusive



NEW YORK Several hundred of the broadcast industry's owners, brokers, bankers and advertisers were present at the roast of CBS correspondent and anchorman Charles Osgood. Also in attendance were present and past Bayliss Foundation scholarship recipients. More than 130 potential broadcasters have received scholarships from The John Bayliss Broadcast Foundation since its inception in 1985. Total scholarship awards to date now exceed \$220,000.



(l to r) H. Ossie Mills, Vice President of Programming for INSP; Greg Liptak, President of Jones International Networks; Gus Bailey, Vice President of Development for Jim Owens & Associates; Jim Owens, President Jim Owens & Associates, Inc.; television personalities Lorianne Crook and Charlie Chase; Eric Hauenstein, Vice President of Jones Satellite Networks; and Jerry Fox, Vice President and General Manager of Jim Owens & Associates, Inc.

interviews with major recording artists as well as news from Nashville and the other country music hot spots. The country music rage does not seem to be abating, and this is a great coup for the Jones Satellite Networks.

Broadcast industry execs know Crook and Chase for their long-running broadcast programming (12 years), including reports and commentary on The Nashville

Network, and as hosts of "The Nashville Record Review," on TNNR (The Nashville Network Radio) which will continue through December of this year.

Jim Owens, president, Jim Owens & Associates will produce the program for Jones.

★ ★ ★

Harris Allied is gearing up for another Richmond Expo. To be held Dec. 4 and 5, the gathering will include lively and informative sessions as well as a sizeable exhibit floor. Those of you who attended last year's Expo know what I'm talking about. In fact, the popularity of last year's one-day show has pushed the event into a two-day affair.

Harris Allied puts on a great expo with some real quality time for hands-on product demos (unlike the crushing crowds of NAB) and practical sessions with some of their best experts.

If you want more info, give them a call at 317-962-8596.



ARC-16: the logical choice for LMA and duopoly transmitter control.

For more information on the ARC-16 family of transmitter controls, contact Burk Technology.

1-800 255-8090



7 Beaver Brook Rd., Littleton, MA 01460
Phone (508) 486-0086, Fax # (508) 486-0081
email danrau@burk.com

COUNTRY WESTERN

FM CLASSIC ROCK

AIM

Put us in your sites.

READERS FORUM

If you have comments for Radio World, call us at 800-336-3045 or send a letter to Readers Forum (Radio World, Box 1214, Falls Church, VA 22041 or MCI Mailbox #302 7776). All letters received become the property of Radio World, to be used at our discretion and as space permits.

Grace under fire

Dear RW,

I read with great interest your recent stories about the trials and tribulations at WTIM Taylorville. It really brought back a lot of fond memories for me.

It isn't the first time that station has had to fight back. In 1977, I was program director/morning jock at WTIM. One morning while I tried to take a day off, the old Gates BC-1F decided to also take some time off. Permanently! Shortly after 6 a.m. sign-on, off it went to stay. By 9:30 the chief engineer (the late Bill VanArsdall) and I determined that it was just too far gone to repair. A phone call to Harris netted us a stroke of luck. They just happened to have an MW-1 on the test floor already running at 1410. I believe it was built for WING in Dayton, Ohio, who agreed to wait a little longer for its transmitter.

Bill got into a truck to go pick up the transmitter and I met him at the tower site when he returned. WTIM was back on the air by 5 p.m., surely setting a record for needing a transmitter, buying it, getting it and installing it: seven-and-a-half hours.

At the time (1977) our studios were located in an old hotel in downtown Taylorville. Wanting to move to an industrial park area, plans were made in the fall of 1977 to move. The lease at the hotel was not renewed and a building was purchased. Work was started and progressed nicely until three weeks before the move. At that time Bill suffered a heart attack that would take him out of action for several months. With studios only half done and commitments made, I became an engineer. With a lot of luck, help from the entire staff and consulting engineer Don Markley, and the support of the owner (the late Jon Ulz), we somehow got the

station moved Dec. 17, 1977.

I cannot take credit for picking the tower site that Randy has to deal with, but I was there. The tower site was placed between the sludge ponds of Georgia Pacific Paper Co. and the leach fields of the Holland Dairy. Not what you consider prime land. However, we believed that it would only flood every 100 years. Well, the every-100-year flood came before the towers were finished. Somewhere I have a picture of a tower man swimming out into the field to attach a cable to his winch truck to pull it out of the water. All you could see was the very top of the winch. Consultant Don Markley wrote perhaps the greatest Environmental Impact Study that I have ever seen to prove that putting a tower at this location would not hurt the environment at all. We also had a problem with the FAA because a tower at this site would mean Class D aircraft would have to circle Taylorville a little higher than normal if landing on the "grass" runway. I doubt if a 747 has ever come close to Taylorville, then or now.

Within a week after putting the site on the air, water came over the tower insulator and shut us down. At this point we strung a long-wire antenna from the building up to the tower. This make-shift antenna stayed there for a long time and was used numerous times when flood waters got too high.

We also had fun when we moved our FM (WEEE) to the site. Great anticipation flowed as we wired everything up, got everything ready, pushed the plate on and watched the transmitter overload. Seems the tower crew forgot to install the bullet in the transmission line. As was our luck, the missing bullet had to go at the antenna. So we waited until the next day when we could climb the tower.

I look back on those days as perhaps my favorite time of my career. It was a local station, committed to the local residents. The station was very well respected and a lot of talent went through its doors. A lot has changed since I left in 1978, but I know Randy has carried on tradition.

Both Bill VanArsdall and Jon Ulz are gone now, but I know they would both smile at your stories about WTIM knowing that some things never change. I am sure they would both join me in saluting Randy and his staff at WTIM for their grace under fire.

Lee J. Freshwater
Ocala, FL

Needs of the few

Dear RW,

I can see my "bleeding-heart" friend Fred Baumgartner (RW, July 26) is like many, confusing non-commercial radio with "government supported radio." I have no problem with 88.1 - 91.9 MHz remaining an educational mecca. (Thank goodness the FCC did not get a chance to divide up the AM band.) All I am asking is that the needs of the few (less than 4 percent) be paid for by all.

If this programming is so important to the educational development of all, let it

Staying in the Game

Radio production personnel continue to be at a disadvantage when it comes to education on the latest equipment trends. Many stations do not even subscribe to the audio production magazines and do not send their production staff to the trade shows. You usually can find the chief engineers and the managers at the spring NAB convention. And at the fall

NAB Radio Show, you can find the programmers and again the managers, but not many production technicians.

That leaves the Audio Engineering Society (AES) annual convention. You would expect that this large show would be the conclusive one for production personnel. After all, companies are showing the latest versions of digital audio workstations, processors, hard disk recorders, DAT, compression boxes, cart replacement, amplifiers, consoles, monitors and microphones. In short, everything a radio station uses and plenty of it.

But judging from the attendance at the 1995 AES show in New York, there were few radio station badges to be seen.

Yes, the production staff is always busy, but not including at least one station representative from the department in trade show plans seems unwise. Who better to know than the person who uses the gear as to what features make the department more productive (within the station's budget, of course)? Although the chief engineer can do a good job of selecting equipment and reporting back from the NAB show, there is no substitute for direct, hands-on tryouts by the production folks.

Do not let decisions to purchase multi-thousand dollar workstations occur without informed input from the production staff. The combination of good audio and good creative will have an impact on your bottom line. The ads, liners and IDs can enhance your image and help reduce tune-out.

To complete the equipment education process, at the very least, station or station group production directors should be sent to the trade shows along with the chief engineer, so they, too, can get an idea of the trends. After all, an enlightened production staff enhances the bottom line; a station will get better quality commercial spots, jingles and on-air audio.

— RW

Radio World

Vol. 19, No. 23

November 15, 1995

Editor in Chief.....Lucia Cobo
Managing Editor.....Whitney Pinion
Technical Editor.....Alan Peterson
Associate Editor.....Angela Novak
Staff Writer.....Lynn Meadows
Assistant Editor.....Christopher Nicholson
Technical Advisors.....John Bisset, Tom McGinley
Editorial Director.....Marlene Lane
Assistant Editorial Director/Audio.....Alan Carter



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

—PRINTED IN THE USA—

**Next Issue of
Radio World
November 29, 1995**

be mandated by parents or a church, but not the federal government.

A lesson in radio economics: Commercial radio is supported by its listeners. Yes, believe it or not, if the listener does not buy the product advertised on the station, the advertiser will not be buying additional time. The station will fail. Non-commercial should be no different. If the listeners will not directly support it then maybe it should not exist.

I know Fred is offended by the pitches presented by many advertisers. Sad but true. Like music and art, this is but a reflection of our society. Don't blame radio. It's just the messenger (and a free one at that).

I agree with Fred that radio is supposed to provide alternative opinions and public service. My problem is who is to dictate what the "alternative opinions" are supposed to be. Surely not the federal government. Let's let the listeners decide. They have that final vote with the on-off switch on the radio.

Paul Montoya
Lakewood, CO

Not so fast

Dear RW,

I was caught by your front page story in the Aug. 9 issue. In an article by Frank Beacham concerning radio on the Internet there seemed to be some errors. Number one of which was the claim that KPIG-FM (Freedom, Calif.) and WKSU-FM (Kent, Ohio) were the first call letter

stations in the United States to offer a range of their audio programming in real-time over the Internet's World Wide Web. This is not the case.

I have enclosed a press release explaining KJHK's presence on the Internet. I have also enclosed several other articles from various publications concerning our pioneer Internet service. Maybe I'm missing something in the article, but I can't see Mr. Beacham's claim that KPIG and WKSU were first by beginning last March.

Additionally, their real-time presence is still not at the same level of development as KJHK's in that we offer a continuous real-time signal of our on-the-air programming, not merely tidbits of audio. Our programming can now be heard by modem on both Apple- and IBM-based systems. Our signal is quite good and has been serving the world for more than eight months.

KJHK's story was also told at last April's NAB convention during the "A Primer on Multimedia and the Internet" seminar, the Federal Communications Bar Association "Program on Radio over the Internet" and the Radio Show in New Orleans.

You may reach the KJHK Home Page at: <http://www.cc.ukans.edu/~kjhknet>

Thank you for your review of this matter. Incidentally, I really enjoy your newspaper and will continue to use it in the future.

Gary L. Hawke
General Manager, KJHK
Lawrence, KS

SBE Elects President

► continued from page 1

causing some tremendous anxieties because, of course, once barriers are broken down, our comfort level changes and we are not so sure exactly where we stand anymore."

"I'm not sure where we are going as an industry, myself, but I feel that it is incumbent on us as the SBE to find out where we are going and then provide our membership with the tools they need to get them there."

According to Baun, that will require an emphasis on education, entrepreneurial skills and a commitment to quality. Baun stressed that all engineers whether they are self-employed or working for a huge company need to develop entrepreneurial skills and communicate the fact that they have those skills to management.

Communication

Baun said that improved communications could help the plight of under-appreciated engineers.

"What we need to do as engineers is first of all explain what we do a little bit better to people so that they understand basically what's happening," he said.

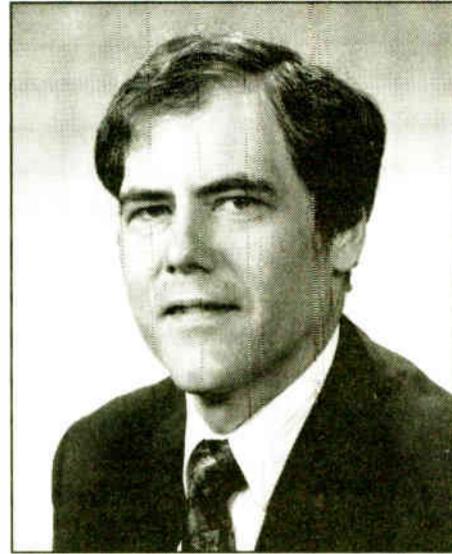
Management sometimes looks at engineers as a "necessary evil," said Baun. He said that engineers need to show management that they understand the expense and revenue sides of the business.

Engineers need to communicate to management that engineering can also provide income, said Baun. He used stations that lease subcarrier space, tower space, and transmitter building space as examples of revenue enhancers that management can appreciate.

"I think we need to have the engineering community being looked upon as a potential profit area as well as a potential expense area." He encouraged engineers to look beyond the immediate problems they were solving to see how their work affects other departments and fits into the

whole process of operating a facility.

According to Baun, the national SBE has been working on improving communication with its own members. He said that each officer and director in the



SBE President Terry Baun

national organization had been made a liaison for a number of chapters nationwide to improve the exchange of questions and ideas.

Change

Baun said he could not predict how broadcast engineering will evolve in the future.

"I'm not so sure that what we are going to be involved in is broadcasting in the way we know it today."

He added that two of the challenges facing engineers right now are rapid change and a need for increased communication since "engineers have a tendency not to be the world's best communicators and we also have a tendency not to like change very much."

Asked how the future looks for broadcast engineers just graduating, Baun said they should not limit themselves.

"If someone came to me right now and said I'd like to be a radio engineer, I'd say great. I think that is a very nice thing to be, and I think that there will be an interesting future in this business, but start thinking of yourself as a media engineer."

"I can't tell you where we are going to be in 10 years or 15 years. We may not have the mix of media that we see right now. You may be in a situation where you have to have additional skills so don't limit yourself going in."

DARS

One of the changes in store is the coming Satellite Digital Audio Radio Services (DARS). Industry watchers wonder how the new service will affect terrestrial radio.

"Everything could be considered a threat if it is something that could potentially take away a listener," said Baun, adding that CB radio was perceived as threat to radio in the 1970s.

He said the key issue will be something that engineers don't have much control over - programming. If the programming is better, said Baun, people will listen.

On the technical side, however, Baun thinks the portability of radio may be its ultimate salvation. He said that although the use of small dishes built into the roofs of cars will be workable on the road, it may not be practical in the home.

"For a wired system whether it is digitally delivered cable radio or satellite, you've got to think a little bit about where you want to listen and make provisions for the listening area." On the other hand, said Baun, you will always be able to move a portable radio into the garage to catch a ball game while you work.

What's Next

Baun did not know what next year will bring, let alone the next decade. "What we are seeing is a coming together of areas that formerly were very disparate. We are seeing radio and television com-

ing together. We are seeing cable coming together and it's all sort of being centered around the PC revolution."

"As I said, I'm not sure where we are going as a society of broadcast engineers. I'm just sure that wherever it is, it is going to be a media support type of emphasis."

"I'd like to think that our membership is broadly based and it has enough technical savvy to be able to provide technical support to a wide range of media no matter how our industry may develop and I think that part of our mission right now is to promote that."

— Lynn Meadows

NRB Debates Licensing

by Lynn Meadows

CAMARILLO, Calif. With ASCAP licenses set to expire next month, the National Religious Broadcasters' Music License Committee (NRBMLC) is crusading for a better music license for stations that do not use a lot of copyrighted music.

"We are interested in helping the radio industry realize this is a historical moment and they need to take advantage of a very unique opportunity to gain music licensing reform," said Russ Hauth, executive director of the committee.

According to Hauth, the fee for a blanket license is 1.65 percent of the adjusted gross revenue of a station. For the current per program license, he said, it is three to four times as high. A station playing 25 percent music might as well use the blanket license said Hauth.

Hauth added that paperwork is a drawback to the current per program license because stations have to log all music played and send the list to ASCAP every month. The NRBMLC would prefer that stations be able to use sampling to file reports which Hauth said is how ASCAP pays royalties to its members.

Bill Slantz, director of broadcast licensing at ASCAP, said that the time of day that music is played is relevant in a per program agreement because ASCAP charges more for "weighted hours" like morning drive.

Hauth said the current per program license is mostly a "token" which is not cost efficient unless a station is 100 percent talk.

The NRBMLC currently represents more than 400 radio stations including classical stations which play almost no copyrighted music. Slantz said that fewer than 900 of the more than 11,000 stations with ASCAP licenses use the per program license.

While negotiations continue between NRBMLC and ASCAP, the committee is attempting to set a trial date for next summer. It is seeking retroactive settlements for the past two music license periods and a per program license with parity to the blanket license.

MIX 'N MATCH

System 10,000 Modular Amplifiers

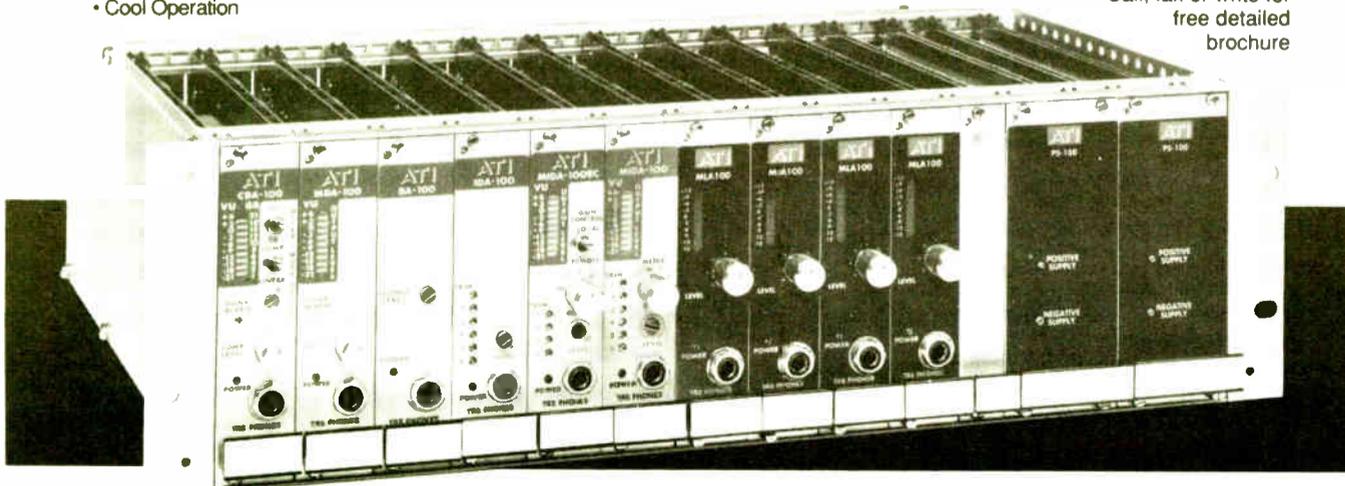
Over 40 interchangeable Microphone, Line and Audio DA Modules for you to mix 'n match to your requirements.

- Transformer or Active Balanced Outputs • VCA Option Available • Backup, Alarmed Power Supplies • RF Protected
- Clean & Quiet Performance • Attractive & Safe Design
- Cool Operation

AUDIO TECHNOLOGIES, INC.
328 W. Maple Ave., Horsham, PA 19044, USA
(215) 443-0330 • FAX (215) 443-0394
1-800-959-0307



Call, fax or write for free detailed brochure



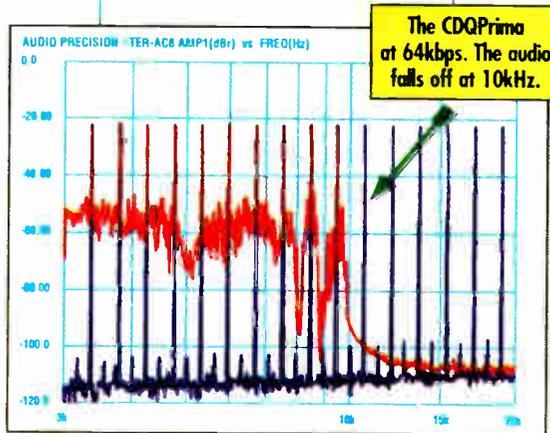
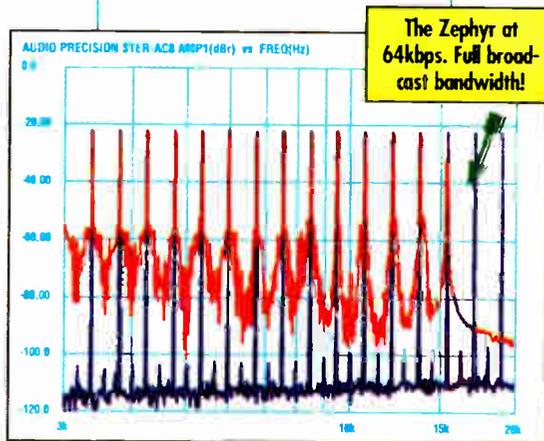
Circle (108) On Reader Service Card

Compatibility, Confidence, and Cost Savings



- Designed by Telos specifically for radio applications on ISDN and Switched 56.
- Clean, uncluttered front panel for simple operation. Full metering, call duration timer, headphone jack, and mic/line inputs.
- Built-in input protection limiter. When your talent screams, your audio does not distort.
- RS-232 bidirectional data at 9600 baud for communications and control. Windows-based software included free.
- Four end-to-end "contact closures" for remote machine control.
- Optional AES/EBU input/output module.
- The ideal solution for remote broadcasts, ad hoc networks, voiceovers, distribution of commercials, backup to satellite and microwave links, and many other applications.

Sports, news, voiceovers, and most other remote broadcast applications are mono. Before Zephyr, the choice was between sacrificing fidelity or using multiple ISDN channels. Not so for Zephyr users who spent the last two years enjoying better sound and lower transmission costs.



On just one of the two digital channels of an ISDN circuit, Zephyr's Layer III delivers 15kHz mono audio. And it yields the same results with a Switched 56 circuit. Other schemes offer a meager 7kHz to 10kHz audio.

Zephyr reliably provides more than just the superior mono and stereo quality of Layer III. With Layer II and G.722 no product lets you easily connect to more sites than Zephyr.



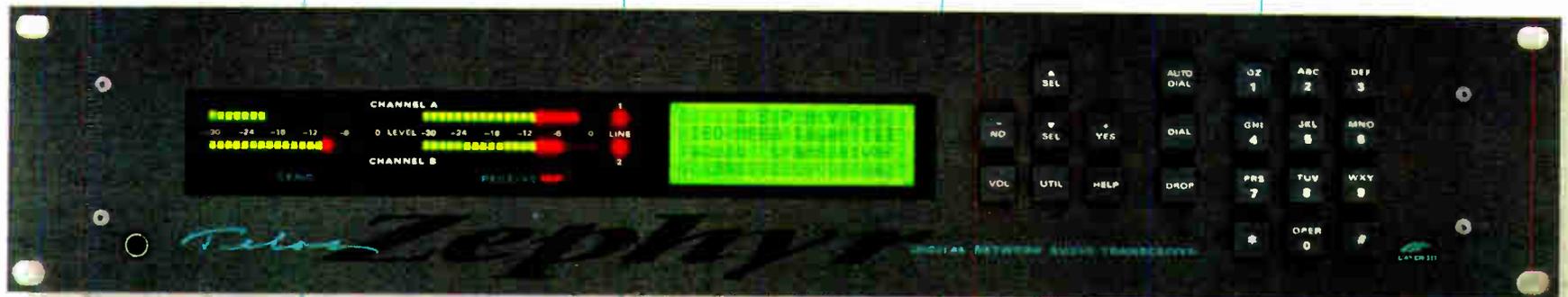
only from



2101 Superior Avenue
Cleveland, Ohio 44114
+1.216.241.7225
FAX: +1.216.241.4103
email: info@zephyr.com

Only Zephyr Has...

- Full compatibility with Zephyrs used by broadcasters worldwide, as well as backward compatibility with all Layer II implementations, such as MUSICAM.
- An integrated terminal adapter designed for the non-technical operator. Setting up a remote is as easy as sending a fax.
- A split channel mode that allows you to transmit two different mono programs to two separate locations using just one ISDN circuit and one Zephyr.
- Telos quality and value resulting from over a decade exclusively dedicated to products for the broadcast-to-telephone interface.



The Best Way to Hear from There™

Telos Zephyr DIGITAL NETWORK AUDIO TRANSMITTER

Telos Systems, the Telos logo, Zephyr, and The Best Way To Hear From There are trademarks of TLS Corporation. All other trademarks are property of their respective holders. Graphs are produced using the protocol Audio Precision Tech Note #14. Complete test results available upon request.

Circle (121) On Reader Service Card

World Radio History

SBE Glad to Be out of Convention Business

by Lynn Meadows

MILWAUKEE SBE President Terry Baun gave RW a look at what some of the issues are that SBE has been working on recently.

For one, he said, the SBE has stabilized its convention situation. "We do a lot of things very well," said Baun. "For example, education and seminars and that sort of thing, but running conventions is a whole different ball game."

Baun said the society is pleased with its current situation at the

spring and fall shows where it offers technical seminars.

"We are doing what we do best, but we are out of the convention business which, quite honestly, is something we never really wanted to be in as a business."

Regional seminars are another way Baun feels the SBE meets members' needs for increasing educational opportunities. The regional seminars "are intended to be small and very affordable sort of miniconventions." The seminars, which sometimes include exhibits, are put on in

smaller areas for smaller groups of people.

The SBE has been actively looking out for its members' interests both at the Federal Communications Commission and on Capitol Hill. Baun said the SBE's FCC Liaison Committee offers guidance to the (FCC) on issues in which the SBE is especially interested and competent.

"One of the most critical areas that the FCC liaison committee is looking at is the continued intrusion, if you will, into the auxiliary spectrum," said Baun.

"Everybody seems to want a piece of the spectrum and we want to make sure that our

the SBE has been trying to get Congress to pass legislation that will require that one of the assis-

The Emergency Alert System has also been a hot topic for the SBE.

broadcast industry is able to maintain its operation in that area because it is a very important one for licensees."

In a tangentially related issue,

tants each FCC commissioner is allowed to hire be an engineering person.

"We feel that the commission primarily is an organization that is not known for its depth of engineering expertise especially at the commissioner level and I think that the absence of that is very telling in some of the things that happen at the FCC," said Baun.

Also in Congress, the SBE has been following ongoing legislation concerned with RF regulation closely.

"That is a very important topic for our membership — exposure to RF radiation both for people who work in the field of broadcast engineering and for those who live and work adjacent to broadcast stations."

The Emergency Alert System has also been a hot topic for the SBE.

"The EAS is probably the first issue that we've had that's come along for a while where we've really had the chance to do some working with the federal government and try to set up a program that's workable," said Baun. He said the SBE will have an EAS primer available soon to help broadcasters implement the new rules.

Move Up from Carts to Touchscreen Digital Audio

Play Any Audio at a Touch

Nothing else makes radio as fast or easy as having all your spots, sounders and sweepers start with your fingertip—*always on-line and ready* to play from hard disk. And *nothing else* makes your station sound as good or as exciting as touchscreen digital and creative talent with the *new Scott Studio System!*

Here's how it works: Six buttons on the left of the 17" computer touchscreen play what's on your program log. Scheduled spots, promos, PSAs and live copy come in automatically from your Scott System Production Bank and your traffic and copy computers. You see legible labels for everything, showing full names, intro times, lengths, endings, announcer initials, outcues, posts, years, tempos and trivia. Your jocks can rearrange anything easily by touching arrows (at mid-screen), or opening windows with the entire day's log and lists of all your recordings.

On the right, 18 "hot keys" start *unscheduled* jingles, sounders, effects, comedy or promos *on the spur of the moment*. You get 26 sets of 18 user-defined instant "hot keys" for your jocks' different needs.

Large digital timers automatically count down into times, and flash at 60-, 45-, and 30-seconds before endings. You also get countdowns the last 15 seconds of each event.



The Scott Studio System is your *best* way to make the move to digital audio and eliminate troublesome carts. Each button on the touchscreen plays whatever you want instantly. All scheduled spots, jingles, promos and scripts come in from your traffic and copy computers.



The World's Fastest Playback!

Touch either of the two buttons at the top right of the main screen to see our "Wall of Carts" with all your audio *on-line!* Touch the sound, spot, jingle, promo, PSA or comedy you want and it plays *instantly*. Or, you can put it anywhere you want in the day's schedule. Audio is displayed any five ways you like.

The Scott System also gives you a "Make Good" button so it's quick and easy to reschedule missed spots or promos.

Instant Requests from Hard Drive

Our most popular option is a 9 gigabyte disk with digital music. The audio quality of the Scott System hard drive meets or beats the best CDs. We'll pre-dub **1,000 songs** from CDs off your *playlist free!*

Nothing is faster than requests from the Scott System! You get five "Wall of Carts" with music that plays at a touch! Songs are displayed by title, artist, year, length, category, or any ways you like.



Live Copy On Screen

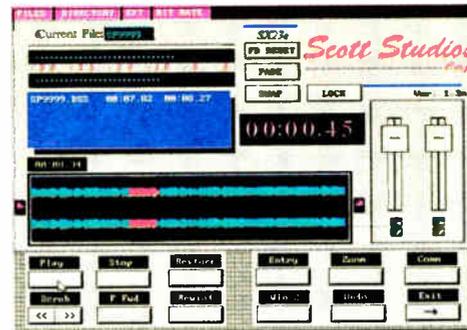
Live tags, weather, promo copy, music trivia, contest copy and winners' lists automatically pop up on your Scott System's screen.

The Best Digital Audio

When spots, promos, PSAs, or any other digital audio events are recorded, they're immediately playable in *all* your Scott System air studios. Nobody wastes time carrying carts down the hall or redubbing spots for additional stations.

One question you *don't* have to worry about with the Scott System is "What if it breaks?" The Scott Cart Replacement System comes complete with *every* spot and jingle stored *redundantly* on *two* hard disks with a *split-second* switch to the "hot standby" computer and its own backup audio outputs! You get touchscreen convenience, digital quality, and backup redundancy for no more money than cart machines and commercial carts.

Circle (53) On Reader Service Card



Sound Better With Digital Editing

Scott Systems' graphic waveform editors work wonders with phone calls in the air studio and creative spots and promos in production.

Your Best Investment

The Scott System *leads the industry* with the biggest broadcast groups like Shamrock, Alliance, Salem, Saga, Liggett, Regent, Tichenor, Heftel, Waterman, Max, Atlantic, and Rawlco in Canada. Our major markets include Detroit, D.C., Dallas, Miami-Ft. Lauderdale, San Diego, Denver, Oklahoma City, San Antonio, and others large and small from Bangor to Bakersfield.

Scott Studios Corp.
13375 Stemmons Freeway, Suite 300
Dallas, Texas 75234 USA
800 726-8877
(800) SCOTT-77

MOVING?

Don't leave us behind!

Mail or fax your current label and new address (with effective date)

to: Circulation, RW, PO Box 1214 Falls Church, VA 22041

or FAX 703-998-2966.

Address changes will be processed within four weeks of receipt.

Thanks!



What do these numbers have in common?

94,608,000.

1,576,800.

26,280.

1,095.

36.

3.

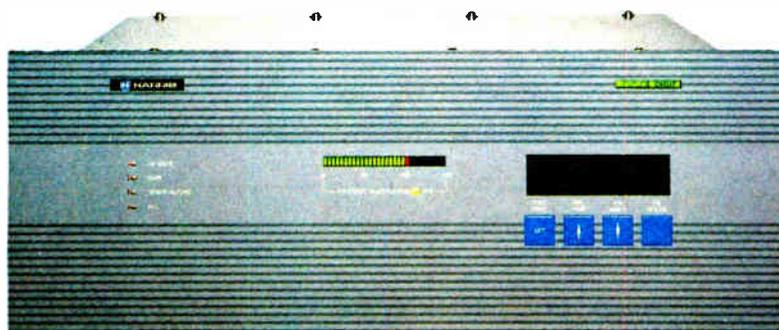


The Clearly Digital answer? They all represent the length of warranty on Harris' DIGIT™, the world's only truly digital FM exciter. And, whether you look at these numbers by seconds, minutes, hours, days, months or years, they add up to the **only** 3-year FM digital exciter warranty in broadcasting!

That's just the beginning. Consider that:

✓ **Only** DIGIT has an AES/EBU digital input that lets you deliver true CD-quality audio to your listeners.

✓ **Only** DIGIT has a DSP digital stereo generator that provides unsurpassed stereo performance with inaudible



noise and distortion.

✓ **Only** DIGIT has a DCL, a secret weapon that eliminates overmodulation peaks and provides the loudest, cleanest signal on the dial.

✓ **Only** DIGIT--standard in all Harris tube and solid state FM transmitters above 1 kilowatt--gives you assurance that you can upgrade from an analog to an all-digital air-chain quickly and easily when you are ready.

These are only some of the reasons why more than 400 FM stations have chosen to put DIGIT's advantages to work for them. To find out how you can begin your journey to a 100% digital FM station with one step--the purchase of a DIGIT Digital FM Exciter, please give us a call. Our friendly staff would love to hear from you.

U.S. and Canada:
Telephone 217-222-8200
Fax 217-224-1439

Elsewhere:
Telephone 217-222-8290
Fax 217-224-2764

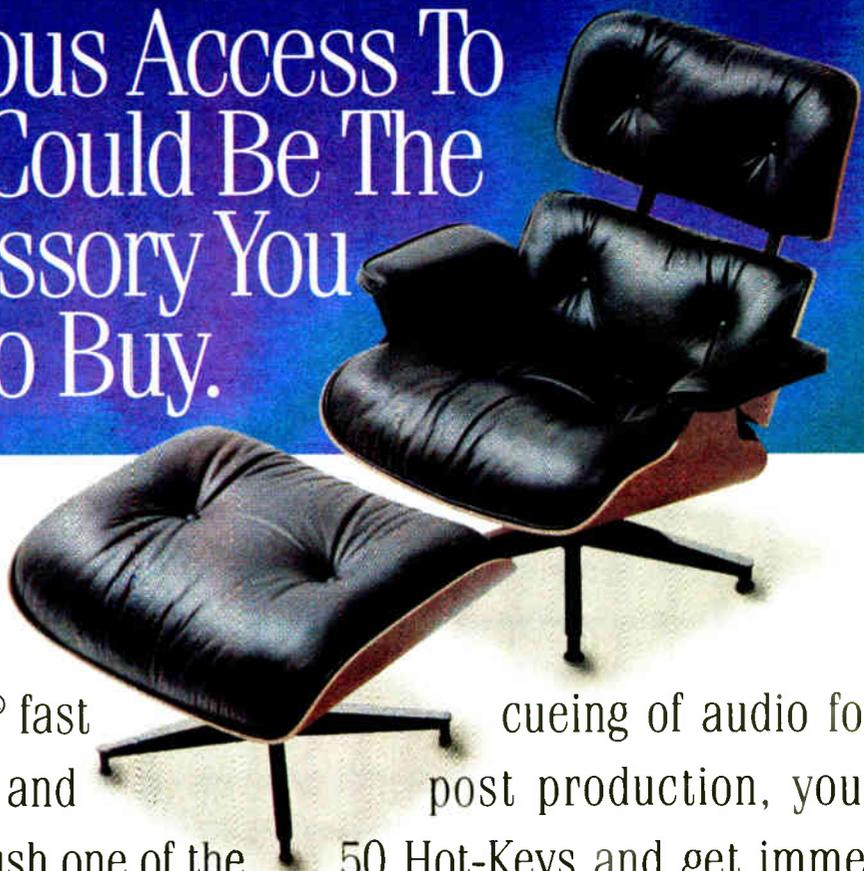
 **HARRIS
ALLIED**

© Harris Corp. 1995

Circle (89) On Reader Service Card

World Radio History

With Instantaneous Access To
1,000 Cuts, This Could Be The
Only Other Accessory You
Will Ever Need To Buy.



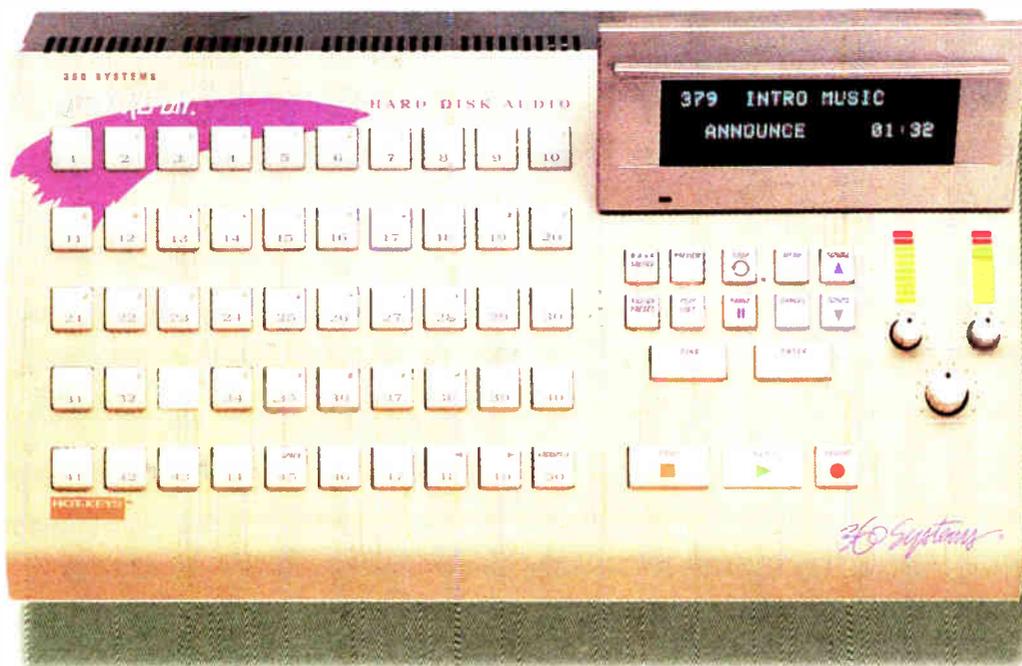
Sure, go ahead. Put your feet up.

Because with Instant Replay's® fast radio, TV, live shows, sports events and work couldn't get any easier. Just push one of the immediate playback of your stored music, sound effects or spots—in stereo, with superlative quality.

cueing of audio for post production, your

50 Hot-Keys and get imme-

Instant Replay is completely self-contained, sports a four or eight hour hard drive, and stores up to 1,000 cuts. There's no limit to the length of any cut, and



no waiting for floppy disks to load. Professional features such as sample rate conversion, analog and digital I/O, automatic head trims, and even a printer port make this machine very agile and genuinely easy to use. *Best of all, it's only \$2,995.*

Instant Replay, the Hard Disk Audio Player

Instant Replay is a new breed of digital audio player—especially designed for people in a hurry. Call 360 Systems today and arrange for a quick demonstration at your facility.

Easy chair optional.

360 Systems®

PROFESSIONAL DIGITAL AUDIO



5321 Sterling Center Drive Westlake Village, CA 91361 USA Phone (818) 991-0360 Fax (818) 991-1360
360 Systems, Instant Replay and Hot-Keys are registered trademarks of 360 Systems ©1995. Eames® Lounge Chair and Ottoman courtesy of Herman Miller, Inc. 800-646-4400

Circle (206) On Reader Service Card

World Radio History

Orban Adds Interface Ease to DSE

by Ty Ford

BALTIMORE Building on the success of its DSE-7000 workstation, Orban has recently added high-speed computer network support for both the Broadcast Electronics AudioVAULT and the Enco DAD486x digital audio systems. The resulting alliances provide a highly efficient system for transferring mono and stereo productions from the Orban DSE-7000, via coax or twisted pair wiring, to either the BE AudioVAULT or Enco DAD486x systems for on-air playback.

Key to the success is the development of a bi-directional communications system that provides the DSE-7000 access to the BE and Enco databases. Separate software was developed for each system.

"We adapted the DSE-7000 system to the BE and Enco configurations. This allows us to interact with and write to their databases. The Enco system is using a Novell file sever. The BE system uses a distributive system without a central file server," said Geoff Steadman, DSE-7000

product manager at Orban.

After a mono or stereo production is mastered and saved to the DSE-7000 library, a "cart" or "cut" is created.

During the "make cart" process the operator is prompted to fill in information, including Category, Name/Number, Replace, Description, Duration, Outcue, Start Date, Kill Date, Client/Artist, Class (list of servers), Create Date, Sample Rate, Mono/Stereo, Compression Type (or linear), Compression Ratio and Scale (digital gain) Level. The Enco database information is similar, although there are minor differences. If the cart name or number is already in use in the on-air system, the operator is prompted to pick a new number or overwrite the existing number.

First in the country to run the new DSE-7000/AudioVAULT network is KSBL, Santa Barbara.

"Our operations director Paul Cavanaugh was interested in getting the station on a network for print, programming, sales and the Internet. He asked Orban about networking the DSE-7000 to our AudioVAULT. They said yes, so we became a beta test site," said general manager/part owner David Perry.

"This is our second DSE-7000. We bought our first one about a year ago for our other two stations here, KTYD and KQSB(AM). The first DSE-7000 is connected to two Format Sentry systems by analog lines, so it is not networked right now, but after seeing how well the DSE-7000/AudioVAULT LAN is working, we expect to expand the network when we upgrade the Format Sentries."

Cavanaugh is equally pleased with the new networked system.

"When we were getting KSBL up and

running we were loading 600 songs and hundreds of commercials and program elements into the AudioVAULT. We were loading commercial and audio from two



Paul Cavanaugh, Operations Manager, Criterion Media Group Inc.

other sources to the same hard drive, all at the same time," he said.

"We used to mix our spots to DAT, and sometimes had to leave one studio and go to another to feed them into the system. Being able to transfer right from the DSE-7000 to the AudioVAULT saves a lot of time."

Because the AudioVAULT supports a variety of MPEG compression ratios, and because KSBL's hard drive was filling quickly, Cavanaugh experimented to find out which, if any, compression ratio would be suitable.

"We found you really can't hear the 3.2:1 ratio. Everyone thought it sounded the most natural, without any artifacts," Cavanaugh said.

Meanwhile, at WSBT(AM) and WNSN-FM in South Bend, Ind., radio studio supervisor Mike Green oversees the operation of two production rooms and the on-air studios.

"There's a DSE-7000 in one production

room and an Enco DAD486x workstation with less production capability in the other," Green said.

"Each DSE-7000 requires its own network card and at least one in the Enco server. Before we had the DSE to Enco transfer capability, and MPEG compression, we used to mix to DAT in the production studio and then load the DAT into the Enco system so it could be available for air-play.

"That meant we had to go to a different room to do the transfer. Now it's all done on the network. Both on-air rooms read from that server."

According to Green, "There's also one Enco DAD486x workstation in the AM studio and another in the FM studio. In each of those computers there's a card that can playback two sources simultaneously. We have 1400 spots for both stations stored on one Enco audio server running Novell 3.12 software. Sometimes the same spot is playing back at slightly different

times on both stations from that server." About 2.1GB of the 3GB Enco storage is used for the 1400 spots, but as Green notes, "That includes a five-hour weekly football game. The neat thing is we normally start playback before the game is over, so we're playing and recording at the same time."

Green has found the MPEG Layer II compression rate operated at 5.3:1 and applied to their 32 kHz sample rate has not raised a flag with the station's golden ears. With compression, done by a card in the DSE-7000, Green says it takes about one minute to transfer a stereo minute of compressed audio to the Enco server.

At both the Santa Barbara and South Bend facilities, the key to the success has been the ease of use of the DSE-7000, its powerful production capabilities, and Orban's ability to create and implement solutions for network integration of both the BE and Enco systems. 

Rating Arbitron

by Lynn Meadows

BALTIMORE The final report on Arbitron's Radio-Schedule Audience Estimate Reliability study concluded that radio's favorite ratings system is a "valid and reliable tool" for estimating the size of the radio audience. It was released in October.

For the study, Arbitron contracted Dr. Roland Soong of Audits & Surveys Worldwide to perform the primary study and conducted additional analysis with his input. The study included 30 metropolitan areas, 104,166 diaries, and 39,600 schedules.

This is the fourth study in 20 years. It was prompted by a growing interest on the part of advertisers to get "guarantees" from stations as to the number of listeners that will hear their spots.

Arbitron offers no opinion on whether or not stations should give guarantees. But Thom Mocarisky of Arbitron said that stations do need to know if the guarantees they offer are reasonable. The report provides formulas to assist stations.

The report found that the reliability of multiple-station Gross Rating Points will be better than that of a single station's GRP.

Arbitron concluded that the reliability of radio schedule audience delivery can vary significantly by market size and the reliability of radio schedule audience estimates can be affected by the breadth of age and sex demographics.

The report also noted that computing GRPs from Arbitron's published AQH ratings instead of unrounded persons projections can add "meaningful additional variance to that GRP." 

Analog & Digital A2-D

Audio Measurement System

The affordable instrument
Designed to meet the challenges
of tomorrow's testing needs

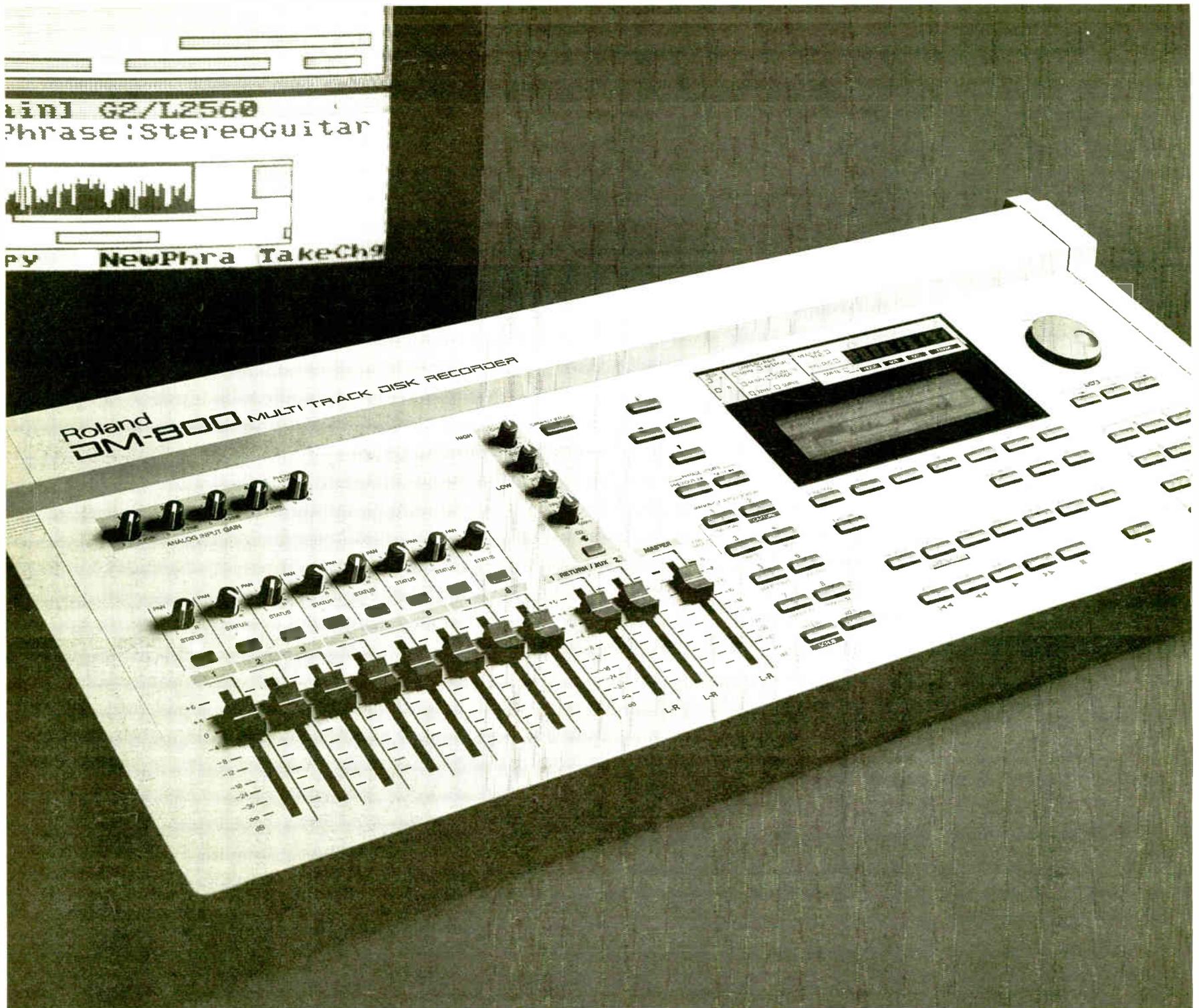
- Analog & Digital Generator and Analyzer
- User friendly front panel
- Stand-alone or remote control via RS-232 or IEEE-488
- Portable

We set the standard in making audio testing AFFORDABLE

NEUTRIK AG Liechtenstein Tel 075 237 34 24 Fax 075 1 232 53 93	NEUTRIK Instrumentation USA Canada Tel 0514 344 5270 Fax 0514 344 5271	NEUTRIK Germany Tel 0941 95241 Fax 0941 99 97 72	NEUTRIK UK Great Britain Tel 0985 811 411 Fax 0983 811 439	NEUTRIK Zurich AG Switzerland Tel 01 734 0400 Fax 01 734 3881
---	---	---	---	--

CONNECTING THE WORLD

Circle (128) On Reader Service Card



The Power Studio From Roland

The new DM-800 provides power, speed, portability and reliability like no other system available.

Power Eight discrete tracks with 100 layers per track. 12 channel automated mixing and EQ. Time compression and pitch correction. Nondestructive, full featured editing. Sub-frame accurate SMPTE sync. Optional ADAT, DA-88 or RS-422 interface.

Speed The DM-800 is easy, fast and quick to learn, using powerful hardware controls with tape recorder style punch in and out. No computer required.

MIDI Support The DM-800 supports MMC, MTC and dynamic functions like tempo mapping, bar and beat editing,

control of external sequencers and trigger mode for instant phrase playback.

Portability All the features and functions you need are contained in a single 12 pound unit. You can literally grab it and take it with you. Uses internal and external SCSI drives. View any level of information on the built-in LCD or plug the DM-800 directly into your video monitor.

Reliability The DM-800 is a completely dedicated piece of hardware with Roland's renowned reliability.

Price Incredible Power. Incredible Price. \$6295.

Call today for your free brochure and video.

Roland[®]

Roland Corporation U.S. 7200 Dominion Circle Los Angeles, CA 90040 (213) 685-5141 Ext. 756 Fax (213) 726-3267
 Roland Canada Music Ltd. 5480 Parkwood Way Richmond, B.C. V6V 2M4 (604) 270-6625 Fax (604) 270-7174

Circle (4) On Reader Service Card

World Radio History

Industry Mourns New York's 'Nightbird'

New York Radio, Colleagues Will Miss Steele

by Alan Haber

NEW YORK True radio pioneer Alison Steele, who flourished on the New York airwaves as the Nightbird, died on Sept. 27, of cancer.

Steele will be remembered not only for her accomplishments as a top female major-market personality in a male dominated field but also for her unique ability to connect with her listeners.

"Alison and New York radio - Alison was unbelievable," said Scott Muni, a New York radio legend whose legacy includes WABC(AM) and WNEW-FM. "She was incredible."

The Nightbird was everything to her listeners: "She was able," said Muni, "with her voice and her mix of music and her space trips (to) transport people from ... whatever world they wanted to get away from ... she just was magic."

First flight

Steele developed her special style on the air at WNEW-AM-FM. Her career as the Nightbird began on Jan. 1, 1968.

"(I) thought about the night time, and it's my favorite time. I knew that when people didn't feel well, they felt worse at night," said Steele in a 1992 interview on Fred



Alison Steele

Migliore's "Another Unconventional Sunday Morning" program on National Public Radio affiliate WFIT-FM in Melbourne, Fla.

"When they were lonely, they were lonelier at night, and I knew that I just couldn't go on the air and say, 'Hi, this is Alison Steele.' I felt if I could develop a relationship with my audience and bring them together, knowing that there were other people out there at night who felt the same as they did, that I would have something, and sure enough it worked."

"(My) most vivid memory is of the night of the 1977 blackout in New York City," said Rachel Ehrenberg, who was an engineer at WNEW in 1976-1977 and now works at KCAL-TV in Los Angeles. Via e-mail, Ehrenberg described the situation:

"FM was completely shut down. I got AM running with a battery-operated console — an old Collins 212Z. I think it was — patched directly into the phone line to our transmitter which was in New Jersey, which had power.

"Til the AM staff could get in — we were in a baseball game and only the

news reader was there, and myself — Alison filled in on the AM side. Her voice had a calming effect on us at the station, and I could imagine the folks who were listening could have only shared that feeling."

One of a kind

As the Nightbird, Steele had a special ability to connect with her audience over the years.

"I think she was extremely conversational, in a sexy way," said Mark Chernoff,

program director at WNEW-FM when Steele was working on WNEW.

"She was not threatening to male or female. I think both sexes enjoyed listening to her."

The Nightbird, said Chernoff, was "one of a kind in a lot of ways. There were a lot of imitators, but there was nobody quite like her."

Format changes at WNEW-FM resulted in Steele's move to WNEW. Soon thereafter, she was hired by K-ROCK to help bring some perspective to the station's simulcast with VH-1 of the movie, "Woodstock." She worked at K-ROCK,

according to Program Director Andre Gardner, until June of this year.

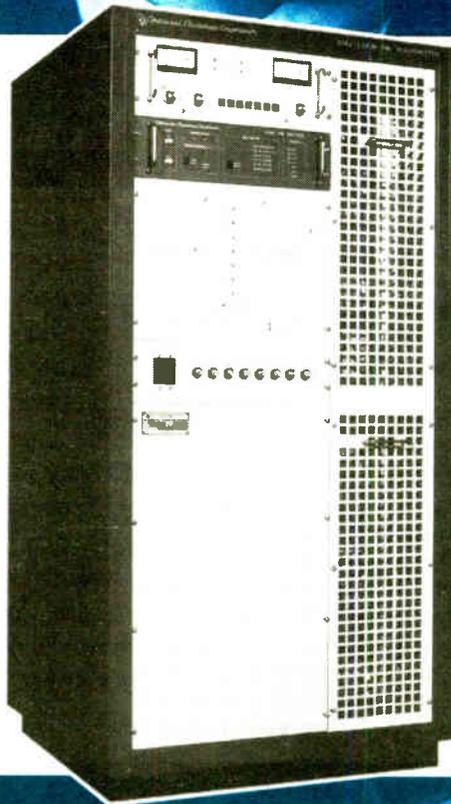
"Everybody should give something — you know, contribute something," the Nightbird told Migliore in 1992. She recited the last line of a poem she said was very important to her: "The importance of life is to count, to stand for something, to have it matter that you lived at all."

(Thank you to Fred Migliore of 1480 East Radio Productions, who allowed portions of his October 1992 interview with Alison Steele to be used in this appreciation).

One Very Popular Efficiency Expert

Tell most station staffs that you're bringing in an efficiency expert, and you can count on elevating heart rates faster than an IRS audit or the word "downsize." But, not to worry, because the Continental 814J 3.8 kW FM broadcast transmitter provides exceptional performance and efficiency without all the turbulence.

Recently, we've incorporated some improvements into an already clean design, enabling the 814J to operate at a power consumption level nearly half its previous rating.* Over the long haul, those savings will make the utility bills considerably easier on your budget. Couple the increased efficiency with



performance features like 100% solid-state components, self-protecting amplifier modules, automatic power output control, automatic power interrupt recycling, and the "Soft-Start"™ SCR circuit. Plus, the 814J is a single cabinet, completely self-contained unit, so required floor space is kept to a minimum.

If you've been looking for an efficiency expert that even the most nervous staff member can live with, call Continental and ask about putting an 814J to work for your station today.

Call 800-733-5011

*6.8 kW nominal at 3.8 kW power output
5.95.105

814J 3.8 kW FM Transmitter

For nearly 50 years, Continental Electronics has provided excellence in broadcast transmission products worldwide. Refuse to compromise... call Continental first!



Continental Electronics Corporation

P.O. BOX 270879 • DALLAS, TEXAS 75227-0879 • 214-381-7161 • FAX 214-381-4949

Circle (116) On Reader Service Card



AES Show Coverage



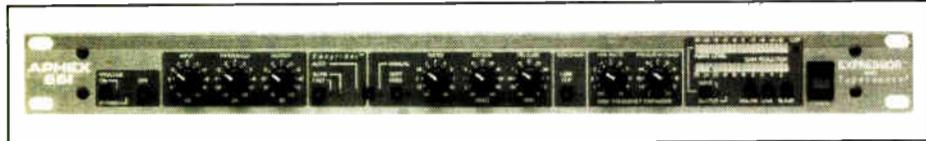
Tubes Talk of the Town at AES Show

by Ty Ford

NEW YORK Vacuum tubes are back, big time, in the Big Apple. At the recent AES show held here, you could not spit without hitting hot glass.

amount of riding from the glass and wire purists this past year for the co-mingling of solid state and tubes in its Tubessence technology.

The Tubessence is now under patent, and guess what? A lot of other players



Aphex Model 661 Tube Expressor Single-Channel Compressor/Limiter

Part of the allure is a response to general boredom on the part of the designers. There is also something romantic about basking in the glow of the filaments.

The other thing is, solid state developments have pretty much stalled out until the next major chip discovery squirts out of R&D. Those guys are spending most of their time trying to decide why — or if — there is a market for a digital microphone and whether it should be AES/EBU or optical.

Let me clarify. By the term "tube amp," I am referring to amplification stages that have at least one vacuum tube. In my humble opinion, Aphex took an undue

out there are doing something similar. A tip of the hat to Aphex for making the move and taking the heat.

Aphex has most recently applied the Tubessence approach to its new Model 661 Tube Expressor single-channel compressor/limiter. This uses a 12AT7 in a transformerless, one rack-space chassis. The Tube Expressor is switchable to work at -10 or +4 levels.

From the "I could stand and watch it for hours" department comes the Studer D19

MicVALVE (\$4,950). This is a two-channel, transformer-balanced, mic/line preamplifier. It has analog outputs as well as 20-bit A/D converters and AES/EBU, ADAT optical or TDIF (DA-88) digital outputs.

The D19 uses DSP dithering and noise-shaping to convert the 20-bit signal to 16-bit. Studer makes a point of mentioning that the 20-bit A/D converter is modular and can be easily upgraded. While the main signal path is solid state, the "Valve Dignifier" stage's two ECC 81 tubes can be switched into each of the two pre-amps.

How about these control names? Bass

There is something romantic about basking in the glow of the filaments.

Warmth, Angel Zoom and Valve Drive. This signals a rather amazing evolution from the historically conservative company. Watch for a D19 test drive article soon.

The D19 Mic AD (\$7,950) is also new to the Studer line. This is a rack-mounted unit that houses eight solid-state mic/line preamps and 20-bit A/D converters. No Valve Dignifiers here, but plenty of extras, including remote control from MicAD Master Remote Controller, Studer mixing consoles, and via MIDI.

Although the new L-200 compact rack-mounted system from API is solid state and not tube-based, its efficient design and good sound qualities make it notable.

The L-200 is a compact, 12-slot, rack-mounted miniframe system. This frame accommodates API's 212L preamp (\$579), 215L sweepable Hi/Lo pass filter (\$495), 235L expander/gate (\$595), 225L compressor/limiter (\$595), 245L de-esser (\$595), 255L balanced line driver (\$529), 265L single-channel mixer module and 275L stereo master mix module.

The L-200 main frame (\$795) is two RU high and accepts a mix of any of the above modules. Once you get started, as with potato chips, it is hard to stop.

Another of my favorite pieces was the dbx single-channel 1650T tube mic preamp (\$3,000). Greg Hanks' explanation of the attention to detail had a great deal to do with my appreciation. More than just a tube mic preamp, the 1650T is also a compressor/limiter with complete gain reduction controls, including switchable preset "compressor simulations" of classic units.

The presets on the dbx 1650T can simulate the Fairchild 660, Neve BA3, Urei LA-2, SSL quad buss and dbx 165A compressors. There are rear-panel jacks for side chain and coupling operation, and for inserts and returns.

According to Hanks and the brochure, the 1650T is unusual because circuit paths are balanced all the way through the entire box. The 1650T uses no AC feedback in its circuits to improve fidelity, but does use some DC and common mode feed-

back in the gain cell and output stages.

At its price point you probably will not find the 1650T in many basement studios any time soon, but it is on my list of "must hears." Hopefully, I'll have the time to do some hands-on articles on all of these boxes later this year.

□□□

Ty Ford found a restaurant on 2nd Ave. that makes great scungilli. He can be reached at 410-889-6201 or Tford1010@aol.com

Mic Legend Shure Dies at 93

by Lynn Meadows

EVANSTON, III. Sidney N. Shure, chairman and founder of Shure Brothers Inc., passed away Oct. 17 at age 93.

S.N. Shure, as he was known, started the Shure Radio Company in 1925 as a wholesale parts supplier for home radio set builders. Seventy years later, it is the world's largest manufacturer of microphones.

Shure started by renting an office in Chicago for \$5 a month where he published a radio parts catalog, one of only six U.S. firms to do so at the time. In 1928, when his brother joined, Shure changed the name to Shure Brothers Inc.

The first microphone produced by Shure was the two-button carbon microphone which was released in 1932. In 1937, Shure introduced the first modern noise-canceling microphone followed by the first controlled magnetic microphone. By 1939, Shure had invented the Unidyne, the world's first single-element directional microphone.

During World War II, the U.S. government needed huge quantities of reliable, shock proof microphones. Shure recruited and trained hundreds of new employees in a crash production program based on the slogan "Microphones are weapons of war." Later the U.S. government awarded the company three Army-Navy "E" awards for excellence in service.

After the war, Shure decided to continue to build all products to military specification so they would be better for the end user. The company boasts that many of its most popular products benefit from design and manufacturing technologies initially developed for the military.

"Mr. Shure's visionary leadership placed Shure Brothers Incorporated at the absolute forefront of the audio industry and kept it there through decades of growth," said James Kogen, company president. Shure is survived by his wife Rose, who is actively involved in the management of the company, and two children.

MARTI

is more than ever before

MD-2E
and **STL-15C**



MARTI's
gone digital



MD-2D
and **R15C**

MARTI is more than ever before and now we've gone **digital**. Introducing the all-new **MARTI** MD-2E and MD-2D **Digital** Encoder and Decoder. Combined with the **MARTI** STL-15C Transmitter and R-15C Receiver, you'll get a high quality, frequency synthesized **Digital Radio Link**. And all at a **MARTI** price. Complete **digital systems** are available from 140MHz to 960MHz.

Call your favorite **MARTI** representative today,
or call **MARTI** direct, 1-817-645-9163

MARTI

ELECTRONICS

1501 N. Main, Cleburne, TX 76031

Phone: 1-817-645-9163 Fax: 1-817-641-3869

World Class Performance — World Class Value.

Circle (211) On Reader Service Card

Your Best ISDN Solution.



Money Back Guaranteed!

Only CDQPrima™ with MUSICAM® is guaranteed to make your ISDN digital audio sound the best!

MUSICAM® is today's digital audio standard. Only MUSICAM® has enhancements designed to sound best over ISDN phone lines. Only MUSICAM-USA® gives you a 30-day money back guarantee.



Don't just take *our* word . . .

Ask over 10,000 MUSICAM® codec users worldwide

•

Ask USA Digital Radio DAB

•

Ask RCA DirectTV, LucasFilm and Top Recording Studios

We guarantee compatibility with MPEG II. Prima will even make your other brand decoder sound great!

Don't stake your next ISDN remote on five-year old Layer III or Layer II technology.

Call MUSICAM-USA® for the facts!



MUSICAM USA

670 North Beers Street
Building 4
Holmdel, NJ 07733 USA
Tel: (908) 739-5600
Fax: (908) 739-1818

Formerly:
Corporate Computer Systems



New Mic Technology at AES Show

by Ty Ford

NEW YORK The AES show at the Jacob Javits Center is always a fun romp, even though the Pope's travelcade made getting around tougher than it had to be. Once inside the Javits, all of the gear and noise made it a challenge to stay focused.

I was looking for special microphones and while I am certain I missed some, the following represents what I saw and heard. Incidentally, kudos to **Sony** and **Acoustic Systems**, both of which had isolation booths (Acoustic Systems sells the booths, of course).

All mic manufacturers should try this,

especially those interested in presenting comparative listening demonstrations. Trying to make any sense out of what you hear in headphones on the show floor is impossible.

This was **Neumann's** first showing of the new M149 tube mic (\$4,200). In spite of the price tag, there was a lot of interest. The price includes mic, power supply, cable, suspension mount and carrying case.

Significant firsts

This is the first new tube mic from Neumann in 30 years and the company's first transformerless tube mic. The M149 uses a version of the Neumann K49 pres-

sure gradient capsule. The circuitry of the M149 uses a tube amplifier coupled with Neumann's FET 100 transformerless circuitry. According to Neumann's Jeff Alexander, Neumann has optimized the M149 tube to have a sound character very similar to that of its U47. The M149 has nine polar patterns and a nine position high-pass filter.

Jerry Graham of GPrime had several new condensers from **Gefell**. The exotic looking M900 (\$995), the UM92.1S (\$2,495) and the M296 (\$950) were the most interesting of the lot.

The M900 is a large-diaphragm cardioid condenser with a chromium-plated backplate covered by a one micron layer of Teflon. The five micron thick Mylar membrane is gold-sputtered. This mic has incredible off-axis HF response. Gefell also makes a hyper-cardioid version, the M910 (\$995).

The UM92.1S is a three-pattern pressure gradient design using two large gold-sputtered handmade PVC-on-glass membranes. It uses the same large diaphragm M7 capsule as in the MT71 and the UMT70S. The UM92.1S features updated tube circuitry with the currently manufactured EF86 tube, rather than the hard-to-find EC92 type.

The Gefell M296 uses a four-micron one-inch nickel pressure capsule in an omni pattern. The mic has a transformerless output. The "price-is-right" large diaphragm Russian **Oktava** MK219 (\$499) and MK 012 omni/cardioid/hyper-cardioid set (\$549) were on display at the Harris Allied booth. A.S. McKay was also showing the Russian **Nevaton** condenser and a new line of Russian dynamic mics from **Byetone**.

There are six dynamic mics in the product line. Five are targeted at the SM57 and SM58 market and the sixth, the handheld, omnidirectional **Byetone** M757, is gunning for the ElectroVoice 635.

Dan Wright from **Curtis Technology** showed the AL-1 transformerless stereo mic system (\$2,000).

The AL-1 is comprised of two mics, a dual-triode vacuum tube design, single rack space power supply and suspension mounts. The mics sounded nice, but you

really could not tell much on the floor. The two-mic approach was interesting, but the lack of specs on the brochure and Wright's close-to-the-vest approach about details made me wary.

Further along, David Josephson of **Josephson Engineering** was showing some of the fifteen condenser mics in his line. Perhaps the most noticeable are the Series Seven.

Condenser news

The C700 (\$2,800) pressure/pressure gradient condenser is approximately a foot tall and two inches in diameter. The basic C700 uses both a 16mm omnidirectional pressure element and a 26mm figure-eight gradient element that terminate in a five-pin XLR.

The signals from the two capsules can be used separately or mixed together.

Recording them on separate tracks allows the amount of directionality of the mic to be adjusted during mixdown.

The C700S (\$3,800) stereo version has two 26mm gradient elements placed at a 90 degree angle (45 degrees left and right), and a 16mm pressure capsule that faces forward.

Back down in the "great deal" price range, I found the **beyerdynamic** TG-X50 (\$249).

This high-output cardioid dynamic mic with a hand-grenade design is thicker sounding than a Sennheiser 421 and has at least as much "whump" as an RE20. I predict the size, shape and sound of this mic will make it attractive to broadcast studios for on-air use.

I did have the opportunity to compare the TG-X50 with a 421 near a computer monitor. The

TG-X50 did a much better job of rejecting EMF from the computer monitor.

Finally, from **ACO Pacific** is the PS9200KIT precision microphone kit (\$1,650). The kit includes the PS9200 two-channel power supply, a 4012 one-half inch preamplifier, CA4012-5 Preamp Cable, PS9 adaptor, WS1 wind-screen, your choice of one of the four half-inch mics and the SC1 storage case.

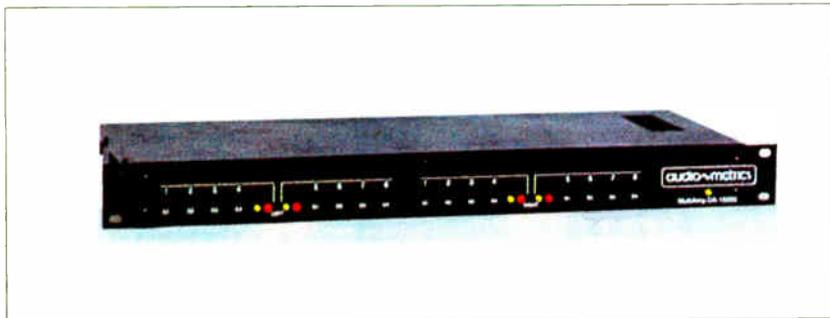
If you are interested in flat frequency response from 2 Hz to 40 kHz and the critical measurement of noise from buildings, printers, auto brakes, tires, rockets, hard disks, cookie crispness analysis and other performance testing, this system deserves a look. ☺



Josephson Engineering
C700 Pressure/Pressure
Gradient Condenser

audio-metrics

DA-16000 Multi-Amp



The Last DA You'll Ever Have to Buy.

Until now you had to pay a premium price for an audio distribution amplifier with specifications like these:

- ✓ Super Low Noise
- ✓ Extra Low Distortion
- ✓ Value Priced
- ✓ Toroidal Power Transformer
- ✓ Audio Presence & Overload Indicators
- ✓ Four Separate Audio Sections

But now we bring you the Audio-Metrics DA-16000 Multi-Amp, the last distribution amplifier you'll ever have to buy.

That's because the DA-16000 is configurable as a quad, stereo, or 16 output mono DA.

Its variable input gain and individually adjustable output attenuators provide a full 48 dB range of amplification. And, the four sets of audio presence and overload LED indicators provide excellent full-time indication of each channel's status and performance.

But most importantly, the careful circuit design, high quality components, and toroidal power supply yield the best noise and distortion specifications available in any DA—at any price!

The DA-16000 is truly a transparent link in your audio chain.

This is definitely the last distribution amplifier you'll ever have to buy. Call the pros at Harris Allied for yours.

1-800-622-0022 Fax 317-966-0623

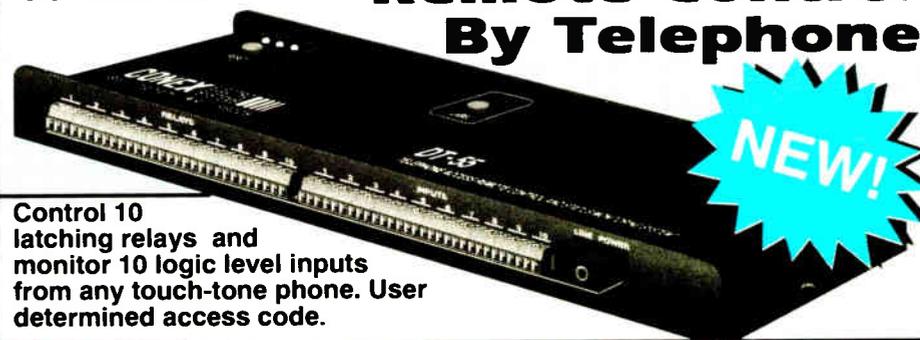
HARRIS ALLIED

©1995 Harris Corp.

Circle (163) On Reader Service Card

9.5" x 2.5" x 1"

**Remote Control
By Telephone**



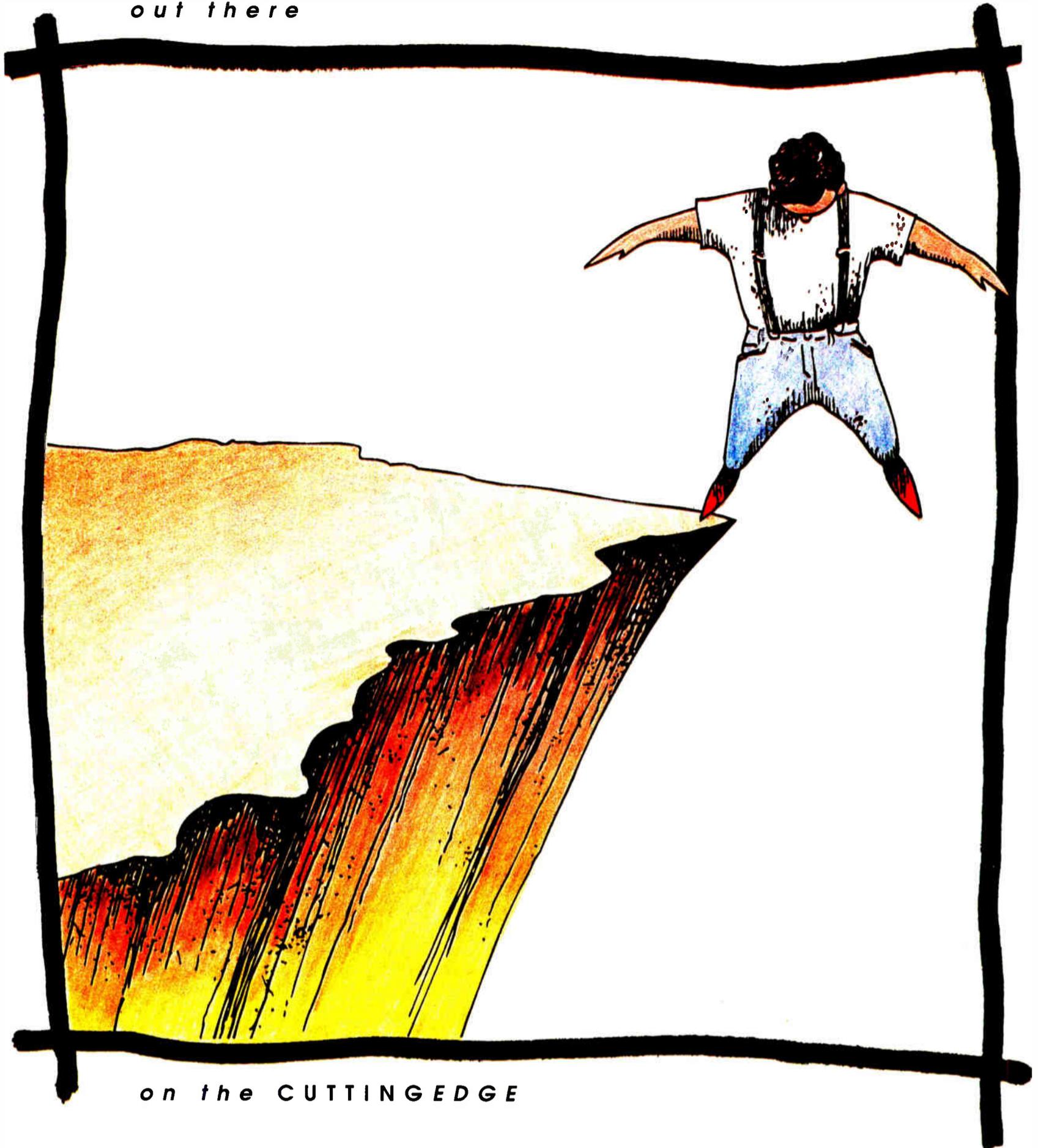
Control 10
latching relays and
monitor 10 logic level inputs
from any touch-tone phone. User
determined access code.

CONEX ELECTRO SYSTEMS
P.O. Box 1342 Bellingham, WA 98227

1-800-645-1061

Circle (184) On Reader Service Card

out there



on the CUTTINGEDGE



don't be afraid of **market dominance**

unity 2000i fm & unity am
broadcast processors



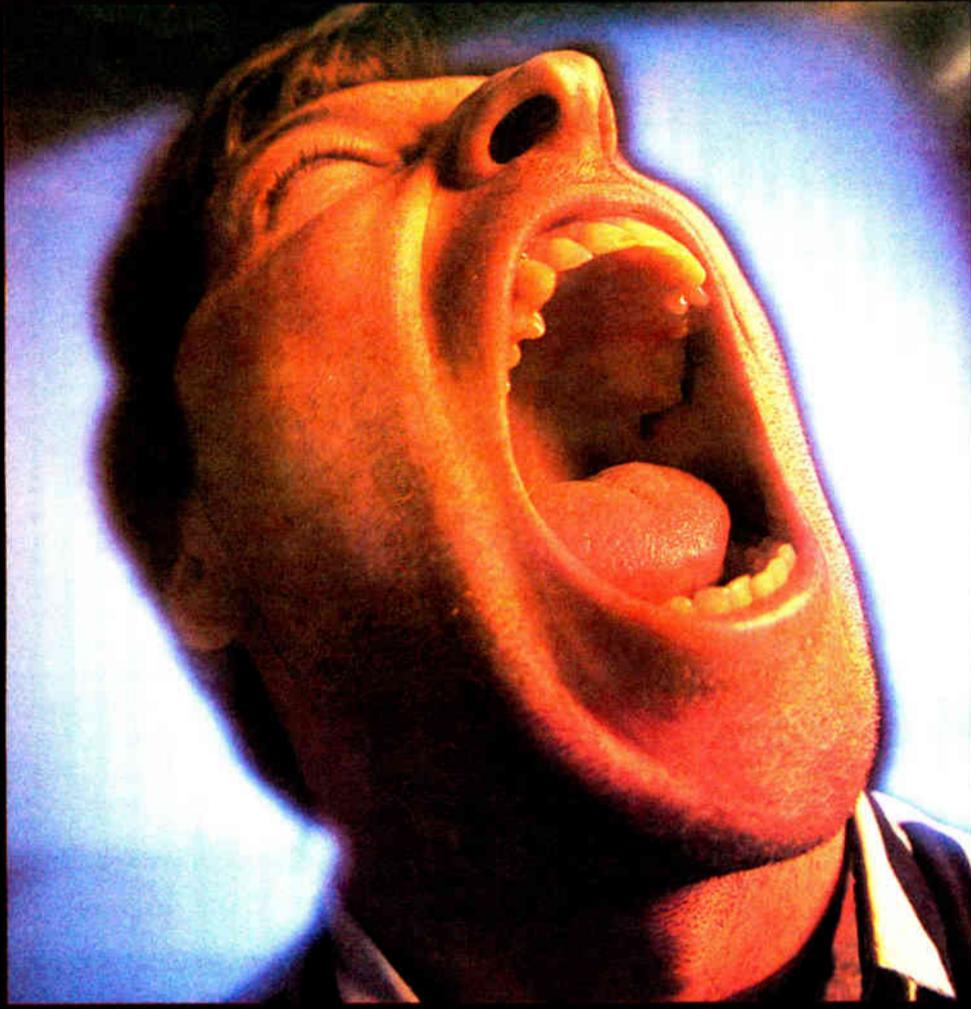
CUTTINGEDGE

2101 SUPERIOR AVENUE • CLEVELAND, OHIO 44114 • TEL: (216) 241-3343 • FAX: (216) 241-4103

Circle (196) On Reader Service Card

World Radio History

Two Proven Methods To Attract More Listeners.



[Shock Jock*: About \$500,000]



[OPTIMOD 9100: About \$5,000]

That's the price of succeeding in AM radio these days: you can buy a big expensive star to reach a larger audience, or put an OPTIMOD-AM at the transmitter. Both give you the strength to be different, even double your audience size. But by "maximizing" your power with the 9100, you also get the closest thing to FM sound with unmatched efficiency.

True, extending your reach while saving on power isn't nearly as much fun as hiring a big, loud star*. But which sounds better to *you*: a bigger mouth, or a bigger bank account?

orban[®]

H A Harman International Company

© 1995 Orban and OPTIMOD are registered trademarks. 1525 Alvarado St., San Leandro, CA 94577 USA
Phone 1-510-351-3500 Fax 1-510-351-0500. E-mail custserv@orban.com

Circle (73) On Reader Service Card

World Radio History

Products & Services Showcase

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

S.C.M.S., Inc. Charlotte, N.C.

Low Prices - Experienced Staff
New and Re-built R.F. and Audio

THIS MONTH'S SPECIAL

**ELECTRO VOICE #7100
POWER AMP**

100 WATTS/CHANNEL

LIST - \$517

SALE - \$299

— You Know We Know Radio —

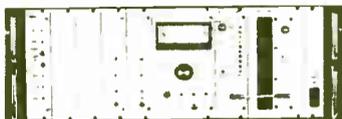
Toll-Free 800-438-6040

FAX 704-889-4540

READER SERVICE NO. 52

Superior Broadcast Products

Designed and built to be the best
150 and 300 watt FM Transmitters



Standard Features:

- Frequency Agile lets you change frequency in minutes
- Overload Protection for Ref. Power, Current, Temp
- Remote Control Interface Built In
- Overload Led's for Ref. Power, Current, Temp
- LED Read out for modulation and deviation
- Front panel power adjustment
- Full Metering of Forward Power, Ref. Power, Current, and B+
- MPX and Mono inputs on rear panel
- One year limited warranty
- 115/230 volts - 50/60 CPS
- Excellent signal quality and reliability
- Ease of Installation
- Meets or exceeds FCC specifications
- Rugged construction for durability
- All modules plug in from front

Optional Plug in Modules:

Compressor/Limiter...Stereo Generator...
Automatic Station ID

Superior Broadcast Products

3941 Legacy Dr, Suite 204-208B Plano, TX 75023
Ph: 800/695-7919 Fax: 800/644-5958

READER SERVICE NO. 5

Composite Audio DA and Switcher!



The CDS 201 Composite DA/switcher

APPLICATIONS

- Switching Between Composite STL's
- Many Alternat. Processing Switching
- Feed Two Transmitters and an RDBS Encoder
- Feed one SCA Generator to Two Transmitters
- Distribute Composite with the Ease of Audio

FEATURES

- 2 Input Switcher
- 3 Isolated Outputs
- Individual Level Control for Each Output
- Front Panel and Remote Control with Full Status
- Power Fail Memory with Bypass Mode
- Inputs Selectable for Balanced or Unbalanced Operation
- Front Panel Test Jack



Broadcast Devices, Inc.
5 Crestview Avenue
Peekskill, NY 10566

Tel: (914) 737-5032 Fax: (914) 736-6916

READER SERVICE NO. 145

TWO NEW ADDITIONS TO THE COAXIAL DYNAMICS WATTCHEMAN® TRANSMITTER PROTECTION SYSTEMS

Models 81081 and 81082 with 15/30/60 kw Meter Scales



NEW!
4-1/16 and 6-1/8
series line sections
and elements to
add to our exciting
line-up

WATTCHEMAN—protects your transmitter and transmission line system. A permanent 19 inch rack installation used with any dual socket line section 7/8", 1-5/8", 3-1/8" and elements (additional) to monitor CW, TV, and FM power. Model 81070 features two easily read meters to monitor both forward and reflected power. The reflected meter provides a front panel adjustable set point which controls the trip level for fast transmitter shut down and alarm. Abnormal load conditions quickly cause transmitter shut down in less than 15 milliseconds including control relay. Both visual and audible alarms indicate system malfunction. Contacts provided for remote alarm and reset switching. Contact us for your nearest authorized Coaxial Dynamics Representative or Distributor in our World Wide Sales Network.

COAXIAL DYNAMICS, INC.

15210 Industrial Parkway • Cleveland, Ohio 44135
(216) 267-2233 or 1-800-COAXIAL • Fax: (216) 267-3142
Service and Dependability A Part of Every Product

READER SERVICE NO. 74

AXS (Ax'-sess)... Jocks Love It!

AXS is an entirely new approach to digital audio controllers. It starts with superb audio using the premium quality apt-X™ system. AXS is easy to learn, easy to use, and powerful beyond words.

AXS is a modular design that begins as a simple cart replacement and grows to any combination of CD, hard disk, satellite or specialty programming with ease.

AXS has all the sophisticated feature options including device independent multi-channel background audio record and replay. Macro programming makes tough to run event sequences easy. Software drives a powerful programmable real time IOMAP.

Jocks love AXS: A fast 99 page, 28 button Jock F/X panel that can be time linked and remote wired is standard.

Use a software driven four-channel stereo audio switcher with on-screen control or the powerful eight-channel dual-buss routing switcher, or include both if you wish. AXS is controlled through a trackball, touchscreen, keyboard, buttonbox, telco or remote modem.

AXS Systems...

From \$6000.00 using your 486 computers and hard disks.

READER SERVICE NO. 189



AXS

The Management

800-334-7823 • 817-625-9761
FAX 817-624-9741

P.O. Box 1-36457 Fort Worth, TX 76136
1700+ Stations • Our 14th Year

MATCHBOX II IS BEST FOR DIGITAL

with its HI-GAIN mode for Power-Mac* and other digital editor sound cards

NEW!!



Get MATCHBOX II to convert your Power-Mac* audio to *balanced* professional levels!

Only MATCHBOX II has *programmable gain* that's optimized for digital editor sound cards.

15,000 units in use worldwide!

- ◆ HI-GAIN mode for digital editors
- ◆ All four outputs adjustable
- ◆ Pro-grade gold-plated RCA jacks
- ◆ Over 110 dB dynamic range
- ◆ Self-contained power supply



TEL (814) 355-3656
FAX (818) 355-0077
FAX-on Demand Doc #120 (818) 355-4210

*Power-Mac is a trademark of Apple Computer

READER SERVICE NO. 120

Attention Advertisers

Reach 18,000+ broadcast equipment buying prospects at AM, FM and AM/FM radio stations, networks and groups, recording studios, engineering and consulting firms every month.

Products & Services Showcase appears in every issue of Radio World.

For detailed information, contact
Skip Tash - East Coast
Dale Tucker - Midwest & West Coast

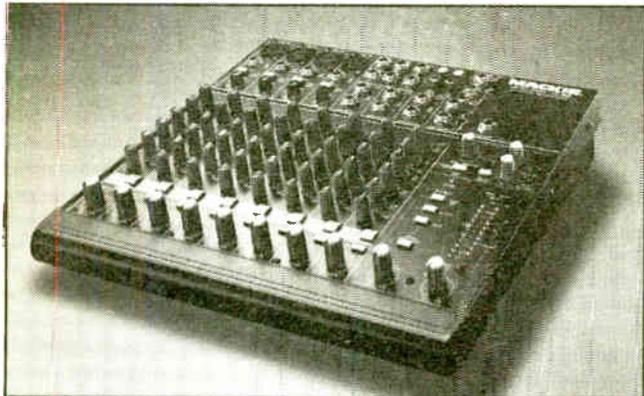
RADIO WORLD

Tel: 1-800-336-3045
FAX: 703-998-2966

Hot Audio Products

► continued from page 19

mixer into the 1202VLZ with three-band EQ, mute buttons and balanced XLR outputs.



Mackie 1202VLZ Mixer

Clones of the popular Mackie compact mixer were in abundance, most notably the 12-input Topaz Mini from Soundtracs, the Phonic MM122 mixer with slide faders and the new Rolls MX1204, soon to be released.

Samson took the concept to a much smaller scale with the Mixpad 9 ultra-compact design mixer. It features three phantom-powered XLR mic connectors, three stereo inputs, balanced stereo outputs and two effect send busses. Fittingly enough, the Mixpad 9 is housed in a nine-by-nine inch chassis.

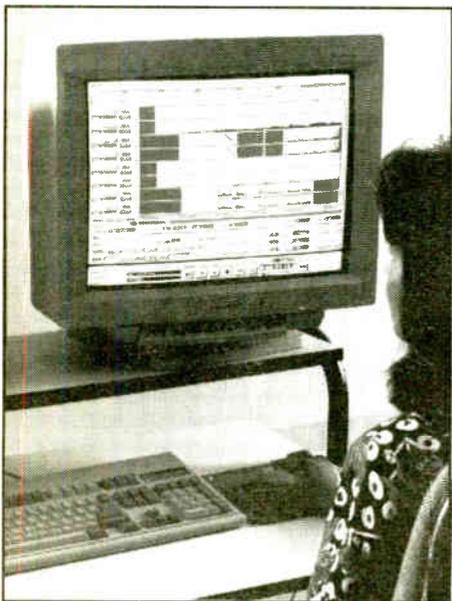


MTG UM92.15

Recorders

Audio pros had their pick of hard drive or tape technologies, with major improvements in both decks and workstations.

The Timeline company announced a third-party agreement with Peavey



Spectral Prisma V2.0 DAW

Electronics to introduce the Media-Matrix DSP audio processor. This Windows-based processing feature allows fine control over EQ, compression and delay within Timeline's Studioframe digital audio workstation.

Timeline also debuted a prototype of the MMR-8 magneto-optical disk

multitrack recorder. While more suited to film post-production, the final design specifications are still pending and may include radio production applications.

Digidesign announced a flurry of new products for its Mac-based line of desktop audio workstations, including the Focusrite digital EQ plug-in, the TC Tools reverberation package and the ProControl modular mixer control surface.

The ProTools III (version 3.1) audio production system allows 16 to

48 tracks of digital audio and supports ADAT and DA-88 formats.

While primarily in the audio-for-Mac business, the company also introduced the AudioMedia III card with Session software for the Windows platform.

Radio production integration was the key to Sonic Solutions' new Radio Workgroup Architecture. The digital audio system is linked through Media-Net, eliminating central servers and allowing all workstations access to the same audio. The Sonic System for radio includes time compression and optional NoNoise sound restoration

tools for noise elimination.

The company's Software Audio Workshop (SAW) now allows a maximum of 32 tracks of realtime playback and 100 simultaneous sound files when run on a Pentium 90 platform.



Mics from Shure

Otari's RADAR hard disk multitrack recorder has been enhanced with the company's new RADAR VIEW monitoring software. All session information, including audio display of all 24 tracks, can be displayed on an SVGA monitor.

MEASURE YOUR COVERAGE...

SATISFY YOUR SPONSORS AND PROVE COMPLIANCE WITH GOVERNMENT REGULATIONS.

For More Information About AM, FM, VHF-TV and UHF-TV Field Strength Meters Please Contact Us.

POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE
SILVER SPRING, MD 20910
(301)589-2662
FAX: (301)589-2665

Circle (7) On Reader Service Card

World Radio History

Spectral unveiled enhancements to the Prisma music system and the flagship 16-track AudioEngine workstation. The Snap Manager feature allows the Prisma to line up random phrases to start on a single beat. The wave redraw on AudioEngine has been improved, as has networking and cross-platform audio production.

Digital Audio Labs joined the fray with the V8 multitrack workstation for IBM-compatible PCs. The V8 can be configured for up to 16 tracks of playback, eight DSP channels and optional ADAT and DA-88 interfaces.

Fairlight drew attention with the Dali two-track recorder/editor, and attracted broadcasters with the MFX3 Main-

continued on page 22 ►

dataworld[®] MAPS

LMA/DUOPOLY
CONTOUR MAPS

The DATAWORLD LMA/DUOPOLY Market Survey Contour maps present a precise electronic verification of overlapping and intersecting contours.

AM 5 mV/m and FM 3.16 mV/m City Grade contours are shown in full color, including transmitter site indicator. The map is supported with a printout showing all of the stations which appear on the map.

Daily updating of DATAWORLD'S AM and FM databases protects against errors and omissions.

OTHER MAP OPTIONS

- SHADOWING (TERRAIN SHIELDING)
- CONTOUR COVERAGE
- POPULATION DENSITY
- ZIP CODE BOUNDARIES
- RECEIVED SIGNAL LEVEL
- SPECIAL REQUIREMENTS

1990 CENSUS

WHO ARE YOUR LISTENERS?

1990 BUREAU OF CENSUS POPULATION COUNTING

- Comprehensive Ethnic and Demographic Data
- Ethnic/Demographic Data Available for Each Zip Code Within Coverage Area
- Age Analysis Reflected in Ethnic Breakout
- Resolution Increased to Block Level
- Percent of County Coverage Shown

ETHNIC PIE-CHART DISPLAY

- Projects Ethnic Population in Multi-Color Pie Chart Form

dataworld[®]

800-368-5754 FAX: 301-656-5341

Circle (176) On Reader Service Card



"I can't believe Bob finally did it!"

*Karen Savelly
Mid-Day Air Personality
WCSX Greater Media
Detroit, MI*

Bob Deitsch, director of engineering at WCSX, has been in radio for 35 years and until he saw the DDS Digital Delivery System, he didn't believe anyone could come up with a digital alternative that answered the stations' needs.

Studio talent wanted the familiar, easy feel of a cart machine. Engineering needed ultra dependability and redundancy.

DDS by Radio Systems answers everyone's needs.

The cart machine emulator interface is a breeze to learn and use.

Jocks air spots while the dual CPUs record and store all of the commercials, jingles and liner audio.

DDS has been on the air at WCSX for over three months and not one spot unit has been missed!



For WCSX-FM, Bob placed four

DDS cart machines in the main air studio, a single unit in the news

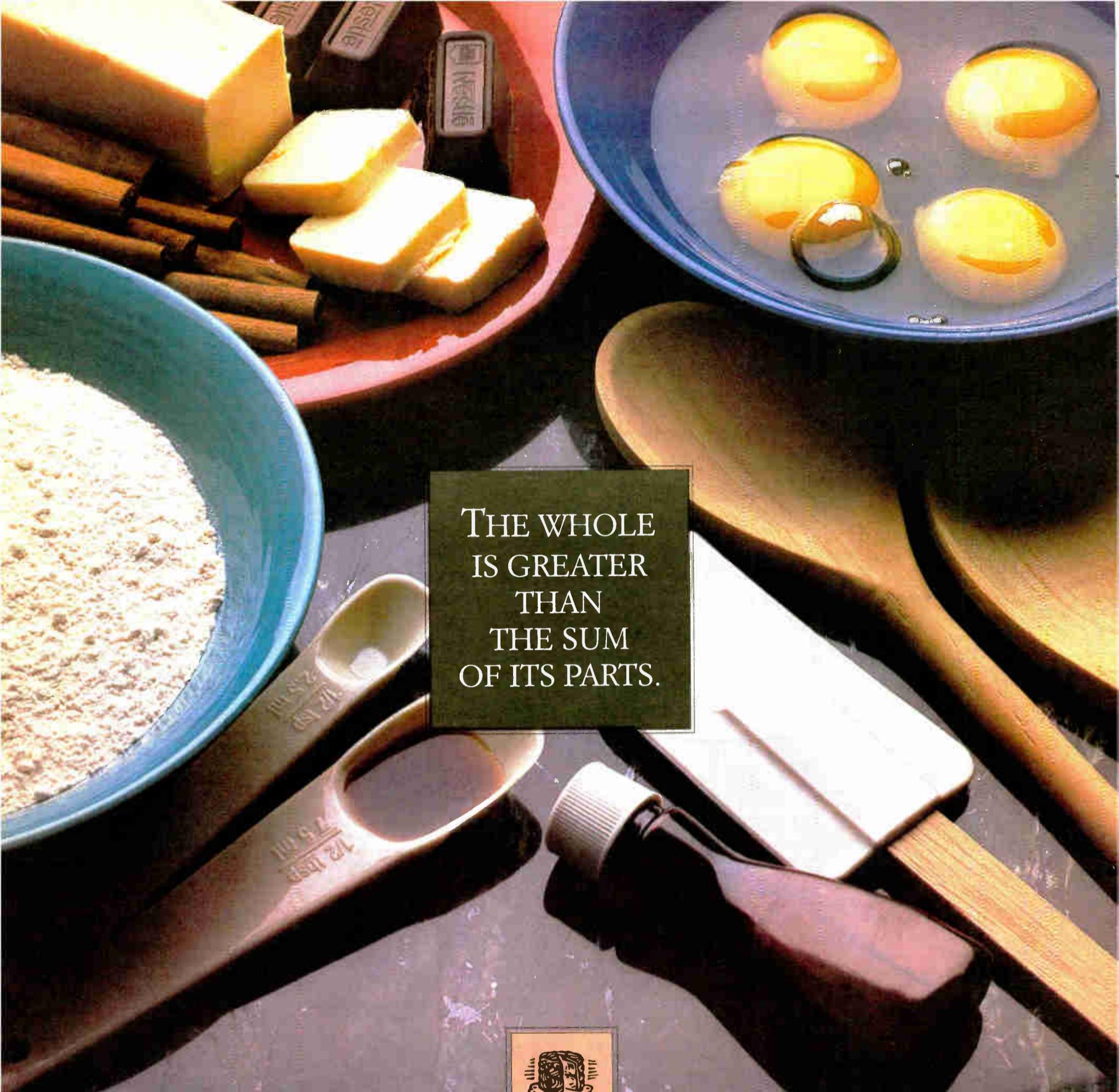
area, and a CRT terminal in

each of the two production facilities.

Contact Harris Allied to find out why DDS is making believers out of the radio industry's toughest customers.

1-800-622-0022
FAX 317-966-0623
<http://www.broadcast.harris.com>

 **HARRIS
ALLIED**



THE WHOLE
IS GREATER
THAN
THE SUM
OF ITS PARTS.



Individually, TAPSCAN's unique and innovative systems for broadcasters are a pretty sweet deal.

But no single system can compare to the strategic synergy created by integrating TAPSCAN programs together in what we call the "Business Intelligence System." It's the most effective combination of sales and marketing tools ever developed for your station.

At the push of a button, you'll know more about your prospects'

That's Why You Need The *Complete* Business Intelligence System.

business and competition...you'll know more about their market potential and the spending power of their customer base...and you'll know precisely how to target and reach a

very specific audience with unparalleled efficiency.

It's a layering process—using information and analysis from one program to gain even deeper insight from another. And when you're done, you'll have put together a more complete and persuasive presentation than ever before.

Gaining a competitive edge is really a piece of cake. To find out how, call TAPSCAN today.



TAPSCAN, INCORPORATED
3000 RIVERCHASE GALLERIA • EIGHTH FLOOR • BIRMINGHAM, ALABAMA 35244
205-987-7456

Circle (95) On Reader Service Card
World Radio History



DISC

DIGITALLY INTEGRATED SATELLITE CONTROL

AVCR Store & Forward

the NEW digital workstation that brings you custom network services !!!!!!!

is here at last !!!

and it is only \$2,500 from

Arrakis Systems

with **Wegener** *digital satellite systems*



Arrakis Systems inc. ☎ 2619 Midpoint Drive, Fort Collins, CO. 80526 ☎ Voice 303-224-2248 (New area code 970)



Why AVCR Store and Forward is so exciting...

Imagine what it would be like if your radio station was on-line and interactive via satellite and telephone with ALL of your network program services: such as news, talk shows, weather, sports, and short & full time satellite programming. Imagine that you received your spots and music currents on-line as well, and that all of this was available at your fingertips to just put into a play list to play on air, without the need for any recording, dubbing, or editing. Imagine not having to make out and mail affidavits... no more reels of tape... a system that calls the network for a resend if there is a problem... Imagine this and much more, and you can imagine AVCR by Arrakis Systems, the #1 manufacturer of digital audio systems for radio.

Question- What is AVCR store & forward?

Answer- AVCR store & forward is a new and better 'digital' way for satellite network services to be supplied to affiliate stations. This is accomplished by placing an inexpensive AVCR digital workstation at the affiliate end of the satellite feed. That workstation is digitally controlled from the network to digitally record network programs. Those programs can be then played back by either network or local control.

Question- What can an AVCR store and forward system do for me?

Answer- Simply put, AVCR saves and makes money for networks and affiliate stations alike. It does this by reducing labor, improving reliability, and providing the capability for dramatic new network services such as localized and customized network programming for affiliate stations. It also improves the quality of your sound, is far more reliable than tape equipment, automatically records the liners, programs, & spots from the network without any affiliate labor, can call the network if there is a problem, can automatically file affidavits back to the network, and can be interfaced to each affiliate's existing digital automation system.

Question- What is the Arrakis AVCR workstation?

Answer- AVCR stands for 'Audio VCR,' and, like a consumer video cassette recorder (VCR), the AVCR is a simple and easy to use record and playback device for network audio. Unlike a VCR which stores programs on magnetic tape, AVCR stores audio digitally on computer hard disk and is actually a compact, dedicated, and inexpensive digital audio workstation. Like the #1 selling Digilink workstation with nearly 2,000 in the field worldwide, the AVCR is from Arrakis Systems inc., the #1 manufacturer of digital audio workstations for radio.

Question- What is an Arrakis DISC System?

Answer- The acronym DISC means 'Digitally Integrated Satellite Control' and stands for a system where one or more AVCR's are connected to an Arrakis Digilink workstation. The Digilink workstation, #1 selling in radio, can then integrate the network programs directly into your station's play list. Simply browse through the latest network feeds, audition the programs, review the tagged text and network E-mail files, and then integrate the network programs into your play list for air in any way you want. While an AVCR may be controlled by non-Arrakis workstations, it receives its full power when working within an Arrakis Digilink environment.

Question- How do Arrakis & Wegener work together to create a complete store & forward system?

Answer- The Arrakis AVCR is designed to work together with the patented Wegener ANCS network control system and addressable digital receivers in such a way that the features of the two products complement each other. As an example, while AVCR may be playing a real time network feed out its own audio output, it can also be playing a time zone delayed feed out the Wegener receivers audio output.

Question- Can I use AVCR as a digital workstation by itself?

Answer- Absolutely !!! That is why AVCR is such a powerful addition to your station. It is a simple, easy to use, and inexpensive black box digital workstation with dozens of options & hundreds of uses throughout your station... *a workstation that also has the remarkable capability for sophisticated network interfacing.*

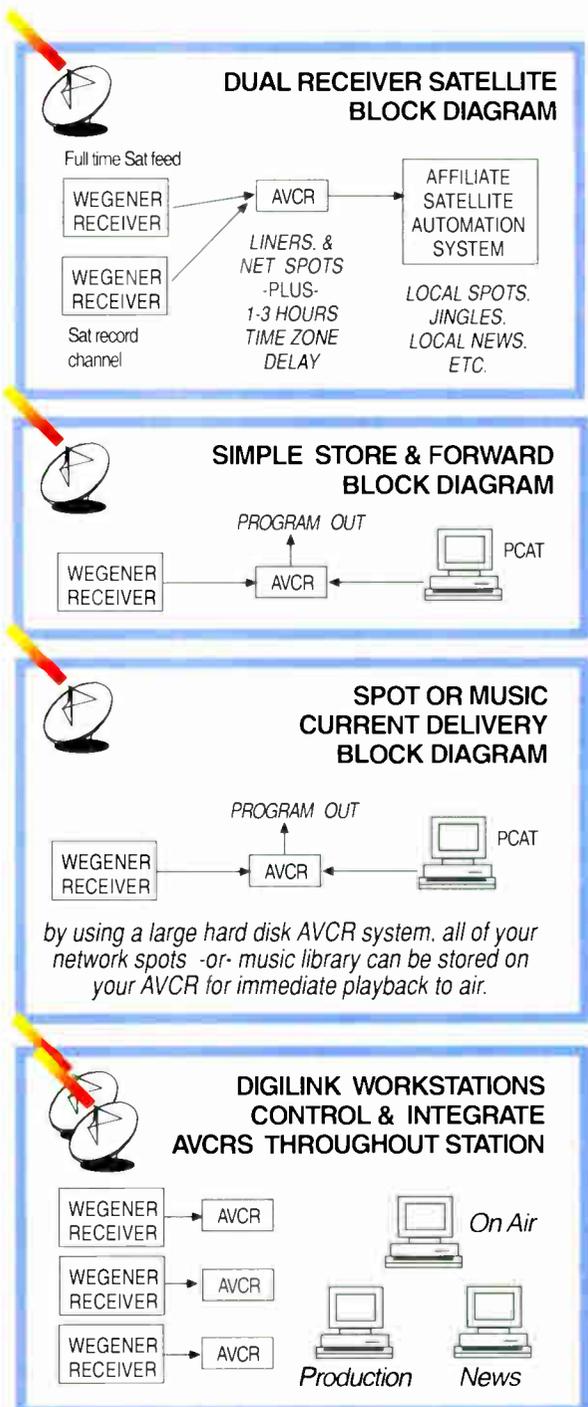
**To answer questions, arrange a factory demonstration, or find out how to place your order,
call Jon Young at Arrakis Systems 303-224-2248 (New area code 970)**

Features

- Prices start at \$2,495 list for a complete 5 hour system supporting network time zone delay & store forward
- ISOMPEG Layer II Compression
- Dual stereo output channels for program and cue outputs
- Modem option for remote control, affidavit retrieval, etc.
- E-mail support from the network
- Supports two Wegener digital receivers for simultaneous
 - 1) Real time record & cue of network feeds -plus-
 - 2) Time Zone delayed main program output
- Digilink workstation control compatible
- 9600 baud data channel embedded into MPEG audio
- many optional system configurations and drive sizes...

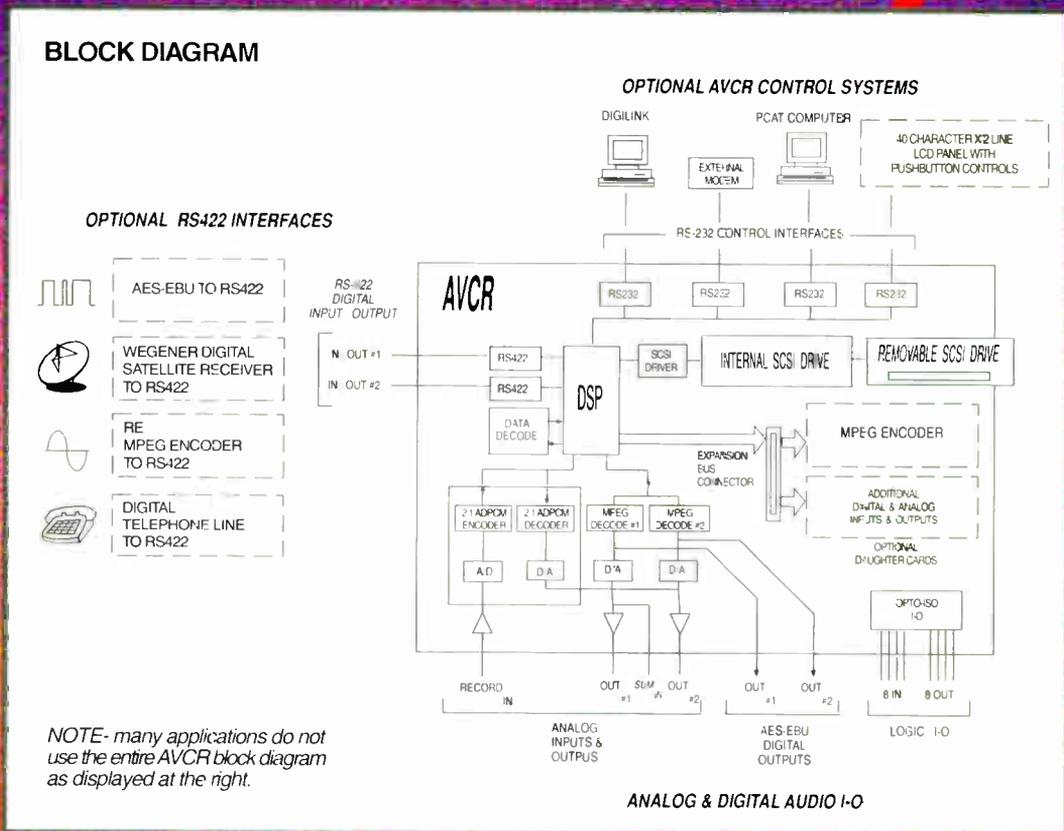
Typical Applications...

- **Improving 'Standard' Satellite Network Services**
AVCR can be used as an entirely network controlled workstation to dramatically improve standard network services: such as network updating of liners, providing regionalized network spots, sending network E-mail, and providing localization & custom network services to individual affiliates. Up to two receivers may be used with a single AVCR to simultaneously be recording new network programs for later play, while receiving and time zone delaying a full time satellite feed. The AVCR can provide standard relay control for the affiliate satellite automation system.
- **Satellite Delivery & Digital Storage of Network Programs**
For networks that send a variety of programs to affiliates for pick and choose playback, AVCR can be used to store network programs while the affiliate reviews, auditions, and then plays them back right from the AVCR workstation. This type of service is ideal for news, weather, sports, etc.
- **Network Spot Delivery Service**
Network spots are presently delivered by mail & various one day services, dubbed, and then played to air. With AVCR, spots can be sent instantly to affiliate stations over satellite and played to air immediately without the need to dub. This saves both time and money.
- **Music Library and Music Current Delivery Service**
Just like network spots, music current services send thousands of CD's to stations every week. With AVCR, new songs are available immediately and at a fraction of the cost in time and dollars of current services.
- **Use Digilink Workstations for Total Integration**
While AVCR's may be controlled in many ways: by the network, a PCAT computer, switch closures, an LCD control panel, etc, by far the most complete control is via an Arrakis Digilink workstation. The Digilink literally shows you the files on the AVCR as if it was in the Digilink itself and allows you to place the AVCR audio in the Digilink playlist. As the #1 selling hard disk workstation for radio with nearly 2,000 workstations in the field worldwide, Digilink is the ideal interface for the AVCR.



Note- affiliate control interfaces can be closures, LCD, PCAT, or Digilink workstations

The block diagram below shows the complete AVCR with several current options. Fundamentally, the system is a black box that is optionally configurable for a variety of digital workstation applications from a network interface to a sophisticated stand alone workstation. To meet these varied needs, the AVCR has two stereo digital RS422 digital input-outputs, four RS232 control ports, optoisolator input-output logic controls, and several analog and AES-EBU input-outputs. An internal expansion connector allows the addition of a daughter card to expand the number of inputs and outputs. Hard disk size for audio storage is optional. Contact the factory for prices on custom configurations to meet your specific network or station needs.



Features, specifications, & prices are subject to change.



2 rack unit AVCR workstation

Call Arrakis for ALL of your broadcast needs !!!



arrakis
SYSTEMS INC.

Arrakis Systems inc. ••• 2619 Midpoint Drive, Fort Collins, CO. 80526 ••• Voice 303-224-2248 (New area code 970)

Running Radio

One on One
with
George Burns
See page 35

Your Resource for Business, Programming & Sales

David Brenner Jumps into Talk Radio

by Alan Haber

NEW ORLEANS David Brenner is wearing a shirt that suggests he is the modern incarnation of Ray Bradbury's Illustrated Man. He is wearing what can only be described as a patchwork shirt — one that looks like it is composed of flashing swatches of fabric stitched together to form a cohesive whole.

One might consider each of these swatches to represent a different facet of the funnyman's professional life: standup comedian; guest host and frequent guest on "The Tonight Show"; host of his own late-night program, "Nightlife"; Broadway star; maker of documentaries he won almost 30 industry awards and citations, including an Emmy, for his work; author (his latest book is "If God Wanted Us to Travel"); and now, host of the aptly-titled "The David Brenner Show" which is distributed by Westwood One to 92 markets and airs weekdays 3 -

Larry King. Now, I had substituted for other people, but I substituted for Larry King, and just sitting there, when he had his night show, and the whole idea of being there and talking all over America and people calling in — it just intrigued me.

When Westwood One approached me, when Larry King was going to leave, and they said, "How would you like to ... take over Larry King's radio show?" I jumped at the opportunity.

RW: You told me earlier that when you started doing your show, you didn't know anything about radio. Now that you're about 15 months into it, what do you know? Are you a lot smarter now about radio? Do you feel like you're a veteran yet?

B: I'm not a veteran. I think radio changes so much, you can't be a veteran. It's changing. It's always flowing. What I've learned about radio is that

of the people. I tailor myself to my own taste, and also I don't do a radio show that everyone else is doing.

I'm not an extremist, on either side of the

political spectrum. I don't hang up on people. I don't insult people. I'm not a portrayer of doom that America's going to hell and we're all going down with it. I'm not a man of violence. I'm not saying that this party's no good, or that's no good, or this race is no good. I'm not a man of hate. I'm

continued on page 27 ▶



Alan Haber (l) and David Brenner

5 p.m., EST.

After broadcasting his program from the floor of the 1995 NAB Radio Show, Brenner and his patchwork shirt joined me for some lively conversation in a quiet room away from the hustle and bustle of the New Orleans Convention Center. I made the observation that it looks like he is having a good time with his show, which has now been on the air for about 15 months.

"Yeah," he said. "It's turning out good."

RW: You are very truthful — you've always been very honest in your comedy. Why did you decide to do a radio talk show?

B: Well, I had always been interested in radio. I loved radio. As a matter of fact, when I was in college, I took radio courses, as well as television, and I happened to go into television and went that way. But one night I substituted for

I've learned what it isn't. It isn't television without a camera. Radio is its own kind of animal. It's an intimacy - theater of the mind as they call it.

RW: When you are talking about a topic, or you are doing a riff on something, does the person in Peoria hear it the same way as the person in Los Angeles? Are you constantly thinking, "Boy, I wonder how this is going to play out in different areas of the country," or do you just go for it?

B: I go for it because I do the same thing with comedy. I never limited myself and said, "Well, this will go over well on the East Coast, but the people down South won't understand it." I never did that, and I've always tried to stay as true. By staying true to myself I'm staying true to the people listening, and if they get it, they're going to listen. If they don't get it, they're not going to listen anymore. I don't tailor myself to the taste

Arrakis Studio Furniture systems are #1 with over 1,000 sold !

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



Arrakis furniture is #1 ...

- Off the shelf -or- Custom
- Easy to design & assemble
- Very fast delivery !!!

call today to find out why Arrakis studio furniture is the choice of broadcasters worldwide...

from Moscow, to Tokyo,
to Manhattan...

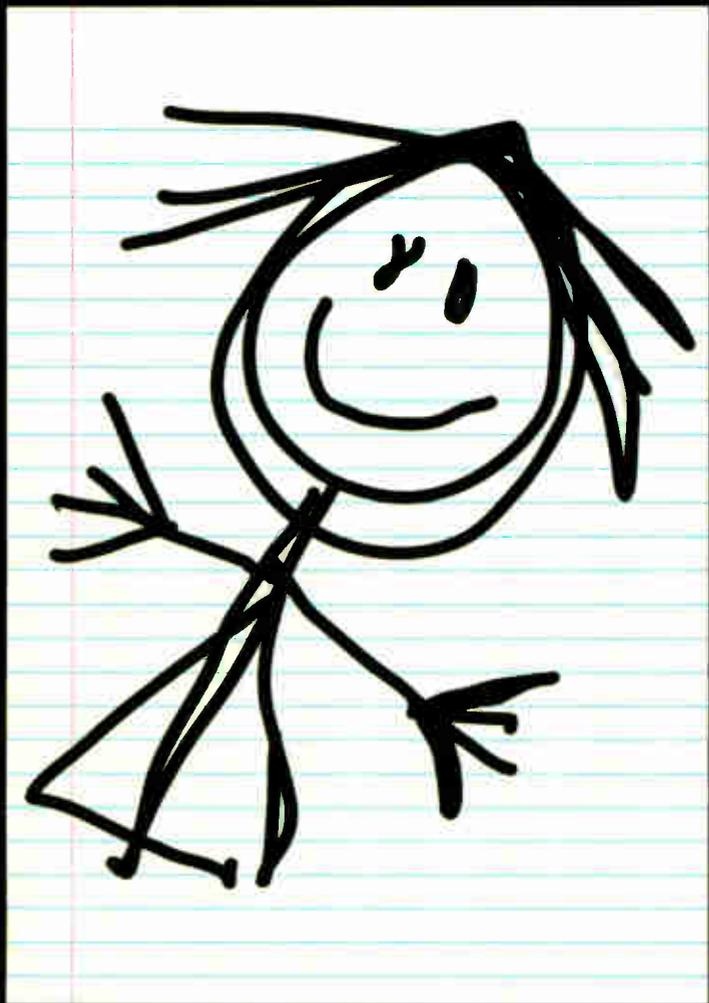
(303) 224-2248

or (970) 224-2248

1995 Arrakis Systems inc. 2619 Midpoint Drive, Fort Collins, CO. 80525



Circle (87) On Reader Service Card



If you could see
how much better
MUSICAM[®] sounds
than Layer II & III



It would look like this.

The first and only quality enhancement to MPEG Layer II is **MUSICAM**[®]. Users around the world have judged it better than Layer II or Layer III and made **MUSICAM**[®] the world standard for digital audio in radio and TV, ISDN, cable, satellites, film sound, music recording and DAB.

Don't rely on primitive technology for your audio masterpieces. For the best sounding digital audio every time, make sure it's **MUSICAM**[®]. Call for the facts.

670 North Beers Street • Building 4
Holmdel, NJ 07733 USA
Tel: (908) 739-5600
Fax: (908) 739-1818



"Because it Sounds the Best"

Circle (179) On Reader Service Card

Brenner Talks It Up

► continued from page 25

not a bigot. I'm not prejudiced. I'm who I am, and I believe in who I am, and if people don't believe it, hey, that's their business. They can listen or not listen. I think I'm trying to entertain everyone, no matter what political spectrum they're sitting or standing on.

RW: *One of the topics that is on broadcast indecency. Howard Stern, of course, comes up all the time when that subject is at hand. What do you think about people who try to get shows like Stern's off the air, and, as they say, clean up the airwaves?*

B: First of all, I think Howard Stern is a very strong force in radio. I have been a Howard Stern fan since he worked in Washington on a local station (WWDC-FM). I have been totally supportive of him, and in spite of the fact that we go at each other on the radio and we're friends, I am more afraid of violating the First Amendment than I am about what happens to people's ears who have a choice whether to listen to something or not listen to it.

I think that you have to be very, very careful when it comes to censorship, whether it's keeping Huck Finn out of the schools or it's keeping Howard Stern off the airwaves. Everyone is entitled. As much as I don't like the neo-Nazi party, they are entitled to meet, to converse, to talk. It's when you are "inciteful" — I think you've got to watch the people who are inciteful. And I think there are radio shows that are inciteful. I think there are radio shows that distort the truth, that tell lies.

You know, Adolph Hitler used the radio as it had never been used before, but, on the other hand, so did Franklin Delano Roosevelt, and there are a lot of Adolph Hitler-type shows in this country today. I think that's what's frightening. I don't think Howard Stern talking about his penis is frightening. I think people talking about hating blacks and others is frightening. I don't think the four letter words that we censor from being heard are frightening. I think four letter words like hate are frightening.

RW: *One of the ways you deal with topics, coming from a comedy background, is with humor — something that is absent in other areas of the radio spectrum. I assume you would think that humor is one of the reasons for your success on the air.*

B: Well, I think that one of the things lacking is humor. Without humor, I couldn't have gotten out of the neighborhood. See, I come from a poor background, and when things were really bad, my father taught me how you use humor to make it so it's not so bad. I think humor is like a salve that you put on a wound until you can get to the doctor and have surgery. I think the American people have got to learn to laugh more. I think at the same time that we're being so concerned about being politically correct, we ought to think about being humorously correct. I think we need more humor ... when you can't laugh at something, you start to be afraid of it or you start to attack it.

RW: *When you grew up in South and West Philadelphia, I assume you listened to the radio. Which stations did you listen to?*

B: WIP and WIFL. WIBG. In Philly, we gave them names. Funny they don't do that. We never called it W-I-B-G, we called it "Wibbage." We didn't say W-I-P, we said "Wip." W-F-I-L was "Wiffle."

I listened to a lot of music ... I didn't see too many talk (shows). There wasn't too much talk then. It was mostly music ... I grew up in rock and roll, and jazz and blues. I was a big radio listener that way.

RW: *Do you listen to other talk radio shows?*

B: No, I don't listen to talk - the only talk radio I listen to is Howard Stern. He's the only one I really enjoy, and the rest of them, I don't really. Here's the story, I know what I don't know. And I know that all the information I get is from my computer, my radio, my TV, my magazines, my newspaper. And I have no inside tracks and neither do they.

RW: *A lot of people talk about localism in radio. When you're talking to a national audience, you're talking to a lot of communities. How do you maintain a national sense of localism, so you can relate the things you're saying to people in different localities around the country?*

B: Well, first of all, I think radio's ridiculous to be afraid of (localism), any more than television. Television is network and local, and you combine the two, that's all. You have breakaways for local, you have local news, you have local programming, but you have national. You can't be closed minded and only have local, only have national, you've got to have both.

Secondly, there is no such thing as local. What does local mean? You know, I was raised as a citizen of the world. My mother told me that there's no such thing as an American, a European, an Asian, just like there's no such thing as a black person, a white person. They're human beings, and we're members of the world community. That's how I was raised, and

continued on page 28 ►

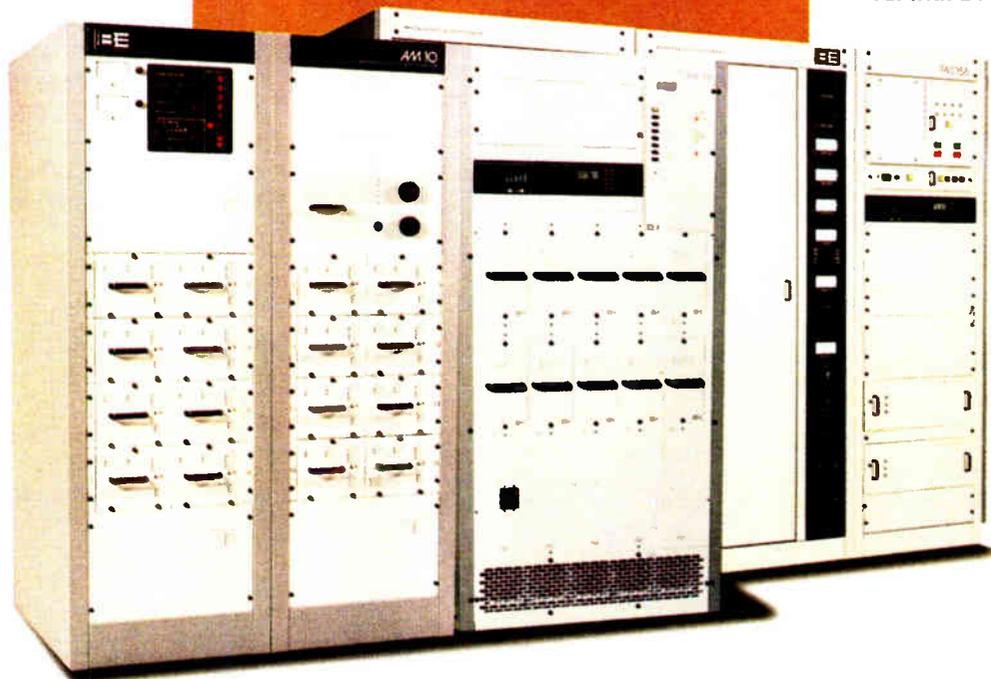
Since 1991, BE has introduced more new AM and FM transmitters, with more advanced ideas and useful technology, than any other company in the world. At the same time we were bringing prices down. No other company can touch Broadcast Electronics for value.

**BROADCAST ELECTRONICS
IS THE ONLY MAJOR
MANUFACTURER DEVOTED
EXCLUSIVELY TO
ENGINEERING BETTER RADIO.
CALL 217-224-9600 NOW.**

**GET MORE
THAN YOU
PAY FOR.**

MORE

- Exciters that deliver CD-quality sound for under \$5400. Broadcast Electronics FX-50 exciter technology is unsurpassed.
- Transmitters with redundant PAs and power supplies that plug in from the front panel.
- AM transmitters with switching power supplies; they sound great at .1% or 100% output power.
- Transmitters with no plate blocking capacitors or sliding contacts to fail.
- Transmitters you can buy for under \$6000.
- All with 24-hour support.



**BE BROADCAST
ELECTRONICS, INC.**
WORLD LEADER IN RADIO BROADCAST TECHNOLOGY

4100 N. 24th Street/P.O. Box 3606/Quincy, IL 62305-3606/(217)224-9600/Fax: (217)224-9607

Revolutionize Radio Advertising

At NAB '95, Ty Ford was commissioned by NAB to present a paper titled "Better Profit and Ratings from Better Copy and Production." The paper was based on the concept that better management of spot breaks will result in reduced active and passive tune-out.

By reducing tune-out, a station gains quarter hours and cume. With better ratings, the station can charge more for its spots and thereby increase revenues. The next several parts deal with how to re-connect with your clients to better serve them and how to better connect with your audience to keep them from tuning out.

PART IV

by Ty Ford

BALTIMORE In parts 1-3 of this excursion, I've identified the reasons that radio advertising isn't working as well as it could. I've demonstrated the problems associated with having weak (or non-existent) commercial policies, and how that weakness contributes to active and passive tune-out. Based on the mail I've received, it appears that a lot of other people have been having some of the same thoughts.

In this installment, I'm headed into some of the gritty details; the actual stuff that makes people actively or passively tune-out. You don't have to be a creative director to understand the concepts. Unfortunately, we've been abusing the language for so long that we've become deaf to the results of our abuse. I call the results "Ad Speak," and it's the number one cause of tune-out.

About five years ago someone faxed me a copy of Chris Lytle's "Killer Cliche" list; a list of words and phrases that have become totally devalued, yet

they appear in ad copy every day. It was simultaneously hilarious and sobering. Here are some of his, and a few I've added since:

- The biggest giant super sale of the century
- You can't beat the prices
- For all your (?) needs
- Conveniently located or located at (?)

RADIO spots

- Now that (?) is in the air
- Perfect as perfect can be
- All the names you know and love/trust
- Don't forget
- Stretch your budget/dollar with values like (?)
- You'll save big on (?)
- Check out a select group of (?)
- The friendly folks at (?)
- Everyday low prices
- We won't be undersold
- Don't miss out

Phrases that are constructed to lure the listener, but offer benefits that cannot be easily provided are the soft porn of ad copy.

The list is growing bigger every day. These words may have meant something when they were first used in ad copy, but they don't any more. Now the only response they elicit is, "Yeah right,

boring ... tune-out!"

These words and phrases still get used because of massive inbreeding in the copy-writing pool. Some overworked copywriter somewhere needs to fill 60 seconds for the client. The writer may have one or two good ideas, but perhaps not enough to fill 60 seconds. The copywriter, knowing that the spot must air in two hours, goes into "automatic mode."

Out pours the Ad Speak to fill in the gaps, and boom ... there's your spot.

This poor excuse for a radio spot doesn't exist

only at your local radio station. If you listen, you can also hear

it on national spots written by people who are getting paid big bucks for their mediocre work.

Redeemable language

Let me interrupt myself for a moment. Many Ad Speak phrases are capable of redemption. Take "everyday low prices," for example. If the copy successfully explains that a company's everyday low prices are significantly different or better than the com-

petition's, the phrase is redeemed. The key is whether the phrase in question offers a benefit that can easily be provided.

Phrases that are constructed to lure the listener, but offer benefits that cannot be easily provided are the soft porn of ad copy. They debase the integrity of your air sound, which diminishes the loyalty of your listeners.

I think a "No Ad Speak" in-house promotion would be an interesting experiment. Give the writers 30 days, or even six months, to clean up their act. Expect each job to take longer than usual because they'll need more time to write spots that don't contain Ad Speak. They'll also need to spend more time with the clients to get the information they need so they can stop relying on Ad Speak.

Then, to keep the air clean, offer a prize for any station employee who catches an Ad Speak phrase on the air. Let the ad agencies that buy your station know about your concern, and what you've done to improve the sound of the station. You probably won't be able to force the agencies to stop using Ad Speak, but your in-house campaign will send an indirect message that may result in their cooperation.

If you do start a No Ad Speak campaign, keep in mind that Ad Speak is not just about a list of words. I wish it was that simple. Ad Speak is about both the words and their intent and use. If you implement the program improperly, you run the risk of turning your

employees into a semantic lynch mob. That's not what this is about. The next installment, Part V, will be about servicing the client. Specifically, it will offer suggestions on helping your client give you the information you need to make spots that work better for them and your station.

□□□

Ty Ford has an attractively priced three-cassette box set of the almost two-hour-long session from NAB '95. He may be reached at 410-889-6201 or Tjford1010@aol.com

David Brenner

► continued from page 27

if they discover life on Mars, I'll be a member of the universe — a citizen of the universe.

I think that the world has grown so small there's no such thing as local. I think you pepper in the local because people want to know if their cars can go down highway 95 or (if) it's going to be jammed. I think they want to know if their mayor has really slept with a sheep. I think they want to know that, and they should. But at the same time, you can't close off the world.

It's all about dialogue, and radio is the best form of dialogue we have. Unfortunately, a lot of it is in the mouths of people who are negative and are preaching hate, and that I find offensive as a human being. Nothing else, not as a comedian, not as a radio person, but as a human being.

RW: If you were given a chance to program a radio station from the ground up, what would you do? What are the kinds of things you'd like to see in the perfect radio station?

B: I'd like to see open minded talk. I'd like to see humor. I'd like to have music. I like diversification. I would like to see new ideas, an exchange of ideas ... and I would like to see no hate talk ... and a major profit, where I get so rich, I'm on a sailboat for the rest of my life.

RW: What are your future plans for the show?

B: Well, you know, (producer and sidekick) Mark (Drucker) and I have become a great team up there ... We're going to keep that there. And we're going to keep the format going the way we are. We're in the target zone now. We know exactly what the show is.

When I went to Westwood One I said, "Let me tell you how serious I am about this." They had a two year contact. I said, "I'm in this for the decade. I'll do this for a decade, because I can do everything else in my life while I do this." That's how serious I am, and I hope that the prophecy is that come next June we don't say "Thank you so much, it's been a great experience and I wish all of you good health and good luck and good-bye," and we say "Tomorrow our show will be ..."

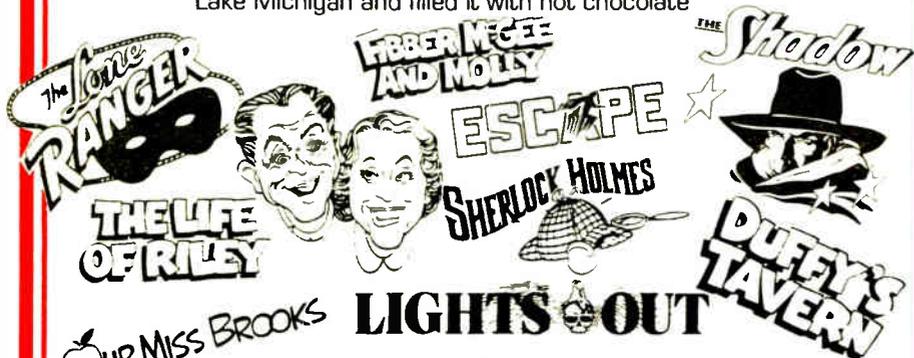
That's what I'm hoping.

ATTENTION P.D.s

Schedule the best in "OLD-TIME RADIO" with

When Radio Was...

Hosted by STAN FREBERG, the man who drained Lake Michigan and filled it with hot chocolate



Five shows per week—54 minutes each.
BARTER, NO CASH PAYMENTS!

For a free demo CD contact David West

DICK BRESCIA ASSOCIATES (201) 385-6566

When Radio Was celebrates its 6th year on 300 stations

STATION SERVICES

News and Services for Business, Programming and Sales

SW Networks Offers Talk Programming Services

NEW YORK SW Networks unveiled its Talk Programming Services package.

SW Networks Talk Programming Services package is offered on a market exclusive basis and consists of a Clipping Service, which culls the most provocative news items from newspapers across the country and the world and provides talking points to stimulate conversation; and a TV Monitoring Service which keeps track of issues from national shows ranging from Larry King and "Nightline" to the Sunday Morning News.

SW's TV Monitoring service provides affiliates with brief synopses of issues and points raised, enabling affiliates with hosts and producers to know at a glance each day's hot-button issues, and Guest Booking Services staffed by experienced talk radio producers who can provide the inside tracks to guests of every sort. As major stories break, SW Networks' producers will have articulate, relevant experts ready for its affiliates to interview. SW's Talk Programming Services package also includes TV Talk Show Excerpts featuring audio clips of the most entertaining and outrageous moments from each day's TV talk-fest.

Staffed by talk radio professionals with extensive experience on both the local and

national levels, SW Networks Talk Programming Services will provide affiliates with the tools they need to remain ahead of the curve in their markets. In the months ahead SW Network's Talk Programming Services Package will continue to expand to meet the needs of its talk radio affiliates.

For more information, contact John McKay, SW Networks, 212-833-5636; or circle Reader Service 11.

New Sunday Program on the USA Radio Network

DALLAS Do your Sunday evenings need some help increasing listeners and ratings? The USA Radio Network now has the answer for you: "Internet @ Night."

This is interactive multimedia geek radio with Tony Reynolds. You can now bring cyberspace to your listeners as they discuss:

- e-mail
- browsing the Web
- newsgroups and usenets
- tools in accessing the Internet
- tips and techniques
- file transfer protocol

Better yet, you can bring new dollars to your station with a proven revenue producer. In Dallas, this unique program was able to triple audience share and AQH in just one

book. Also, your station will enjoy complimentary Internet sign-on, the Internet Service Provider Program, a presence on the World Wide Web and much more.

Starting in October, you can hear "Internet @ Night" from 10 p.m.-1 a.m., EST on the USA Radio Network. Now available on SATCOM C-5, Transponder 15, and Spacenet III, Transponder 7H.

Call the USA Radio Network Affiliate Services Department at 800-829-8111; or circle Reader Service 17.

Gibbons Signs Agreement with Premiere Radio Networks

LOS ANGELES Premiere Radio Networks, Inc. (NASDAQ: "PRNI") announced that Leeza Gibbons, star of CBS' hugely successful "Entertainment Tonight" and NBC's multiple daytime Emmy-nominated daily talk show, has signed an exclusive agreement with Premiere to syndicate "Entertainment Tonight on the Radio" and "Blockbuster's Top 25 Countdown with Leeza Gibbons." The current programs reach approximately 150 radio station affiliates.

The company also stated that together they plan to pursue the production of long-form programs and radio specials. These programs will be created in conjunction with her production company

The Leeza Gibbons Enterprises (LGE).

For more information, contact Harold Wrobel, Premiere Radio Networks, at 818-377-5300; or circle Reader Service 203.

Overnight Sports Talk Show Debuts

SAN FRANCISCO Sports Byline USA, hosted weeknights by Ron Barr and America's No. 1 radio sports talk show, has expanded its overnight lineup to include Sports Overnight America.

Sports Overnight America, hosted by David Brody, provides five hours of live sports talk Monday through Friday, 1-6 a.m. EST following Sports Byline USA, 10 p.m.-1 a.m. EST.

Earlier this year Sports Byline USA added eight hours of programming Saturday and Sunday with Sports Byline USA-Weekend featuring the "Regular Guys."

"We are very pleased to now offer eight hours of live sports talk programming seven days a week," said Barr. "It gives listeners the opportunity to talk with David and share their views with other sports fans across America."

The overnight show debuted on Sept. 18 with nearly 200 affiliates.

David Brody began his sports broadcasting career in 1981 and has handled college

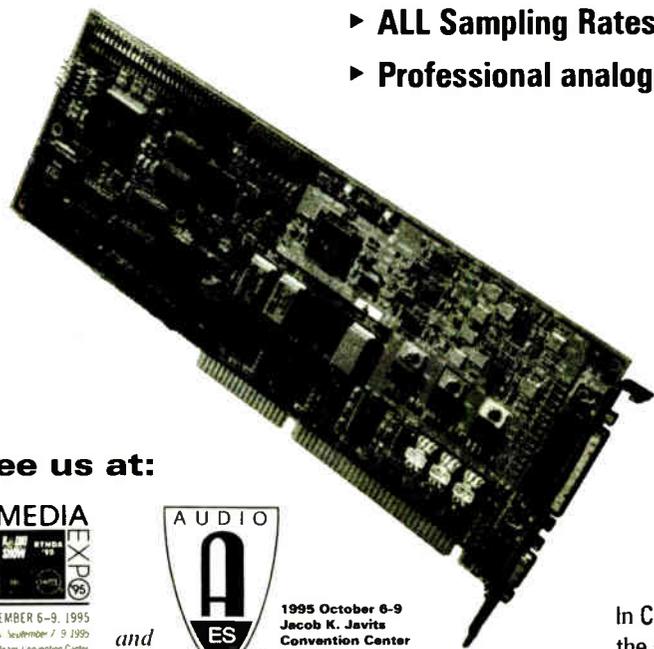
continued on page 36 ▶

Introducing...

Capella Live!

The First Real-time PC Based MPEG Audio Codec

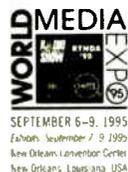
- ▶ Real-time audio transmission
- ▶ Real-time record-to and playback from disk
- ▶ ALL Sampling Rates up to 48 kHz
- ▶ Professional analog and digital interfaces
- ▶ MPEG Audio Layer II Compression
- ▶ G.722 for compatibility
- ▶ ISA PC-compatible
- ▶ Optional MPEG editing software



In addition to all these features, Capella offers exceptional audio quality for direct-to-disk recording, sampling, and reproduction. With an optional ISDN terminal adapter you can do real-time audio transmission up to 384 Kbit/s! Capella also comes with a software developer's kit that provides the perfect solution for tailoring your own audio application.

So if you are looking for the ultimate in flexibility and sound quality, discover the quality of audio à Capella today.

See us at:



1995 October 6-9
Jacob K. Javits
Convention Center
New York, NY, USA

In Canada and
the Continental U.S.
call toll free:
1-800-555-7700

MPR Teltech Ltd
8999 Nelson Way
Burnaby, BC
Canada V5A 4B5
Tel: 604-294-1471
Fax: 604-293-5787

Europe: **MPR Teltech Ltd**
Postfach 1855
Ob. Hauptstr. 52
D-85354 Freising
Germany
Tel: 49-8161-42400
Fax: 49-8161-41234



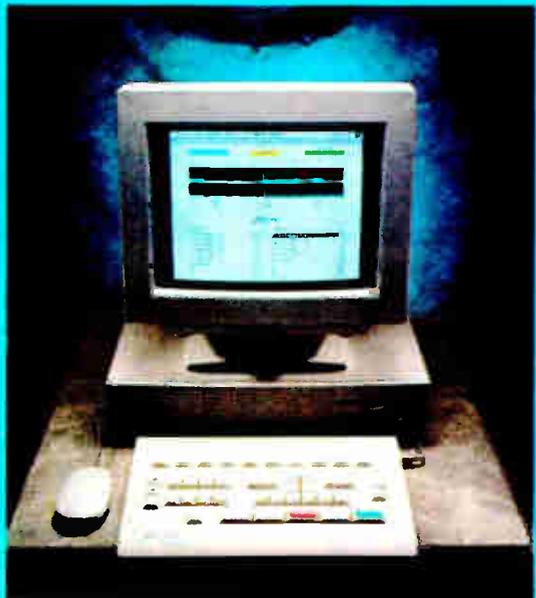
MPR Teltech Ltd®

**Dealer
enquiries
welcome!**

Running Radio 1996

- January 10:** Production Libraries, Voice-overs, Jingle Houses
- February 7:** RAB Preview
- February 2:** Country Radio Seminar Preview
- March 6:** Radio Networks
- March 20:** NAB Spring Show Preview
- April 17:** Sports & Event Marketing
- May 1:** Programming & Sales Research

See VoxPro™ in Action.



VoxPro™ is the first Digital Sound Editing System specifically designed to replace reel-to-reel tape recorders used on the air.

Now you can record and edit phone bits, contests, actualities, sound effects and more— on the fly, with speed and precision.

VoxPro operates like a word processor for sound. It begins by providing true one-touch recording.

Editing and playback couldn't get any easier than with VoxPro's "cut, copy and paste."

Unlike any other— VoxPro is fast. It's simple. And it's designed to meet the special needs of the on-air broadcast professional.



FREE VIDEO

See why VoxPro is the largest selling digital phone editor in the world. See it in action— on the air, in news-talk, country and rock formats— all in a special VoxPro video. Also featured is a four minute tutorial showing the VoxPro basics and why it's so quick and easy to learn.

Once you see this video, you'll know why VoxPro is the perfect reel-to-reel replacement in control and news rooms. Call us toll-free for your complimentary copy.

1-800-622-0022



©1995 Harris Corp.

Circle (34) On Reader Service Card

Rush Limbaugh Loses Initial Legal Battle

by Lynn Meadows

BOULDER, Colo. A Rush by any other name ... could cost \$20 million.

Last year, conservative talk show host Rush Limbaugh filed a lawsuit against Aaron Harber. Harber was the host of "After the Rush," a show described as "progressive."

According to counsel for Harber, the Limbaugh case centered around the argument that he should own exclusive rights to his own name. In October, a judge determined that the use of the word "rush" did not violate Limbaugh's rights as far as his name was concerned.

Still to be determined at press time, however, was whether a consumer could

confuse the name "After the Rush" with the "Rush Limbaugh Show." Harber has approximately 50 affiliates nationwide. Limbaugh has 645.

Harber had renamed the show "The Aaron Harber Show" after the lawsuit began. With the recent decision, it will change again to "Against the Rush." Harber said the new name "does a better job of conveying my opposition to the 'rush' of conservative talk show hosts."

According to Harber, the case is a "frivolous lawsuit filed to intimidate an opponent." He said that both sides could waste over \$250,000 on time and legal resources arguing the case. The Limbaugh team had "no comment" on the case.



Rush Limbaugh

NEW

7.5 kHz audio over plain telephone lines



every time!

Introducing the Scoop Reporter from AETA: a revolutionary CODEC that gives you low delay (30ms) broadcast quality audio from any telephone jack. With its built-in V.34 modem and the robust CELP* algorithm, the Scoop Reporter will operate at bit rates as low as 24 Kbit/s (the highest rate consistently achievable by 28.8K V.34 modems) or even 21.6 Kbit/s.

Look too for these other features:

- Compact and portable design (4kg)
 - Input mixer for Mic and AUX
 - Headset and line outputs
 - Mains or battery operated
 - Up to 3 hours of autonomy
 - Regular field telephone mode
- Call AETA today and find out about the Scoop Reporter and our full line of ISDN CODECs.

USA 2055 E. Calle Maderas, Mesa, AZ 85210. Tel: (602) 464-0085 Fax: (602) 964-0804

EUROPE 361 Av. du Général de Gaulle, 92140 Clamart, France. Tel: +33 1 41 36 12 12 Fax: +33 1 41 36 12 13



Performance

Reliability

Circle (60) On Reader Service Card

The hybrid you put between these cables is your most important connection for successful talk shows



Listeners and programmers agree.

The quality of your talk shows and call-ins are as critical as who you have talking.
And stations who are most serious about their sound and ratings use Telos.

Telos' digital hybrids have earned their reputation for exceptional performance.
In addition to full-duplex audio, Telos hybrids achieve consistent levels from caller to caller.

Our full range of products includes the top of the line Telos 100 Delta with a digital dynamic equalizer so advanced you won't find it anywhere else. When it comes to complete systems, the ONE-x-Six proves you don't have to spend a lot to get Telos quality and features.

Let Telos connect you to your callers. Isn't it time you experienced great phones?



only from



2101 Superior Avenue • Cleveland, Ohio 44114 USA • Tel: +1.216.241.7225 • Fax: +1.216.241.4103 • email: info@zephyr.com

Circle (55) On Reader Service Card

World Radio History

NEW !!!

Digilink III-

**4 x the power
& On Sale !!!!**



- **The #1 selling Digilink II has a new big brother !!!**
- **Digilink III has 4 times the processing power of Digilink II with...**
 - **Triple play capability (DL2 is dual play)**
 - **Dual audio outputs for On Air and Cueing (DL2 has one)**
 - **Do On Air & Production from a single workstation !!!**

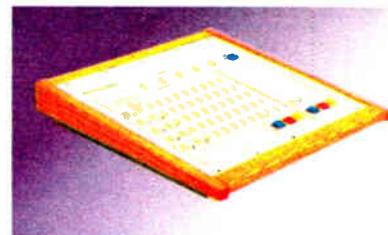
Digilink III is a *NEW* multipurpose digital audio workstation for Live On Air, Production, and Automation. Fully compatible with the #1 selling and industry standard Digilink II, the Digilink III has four times the raw processing power of the Digilink II and features a second audio output for cueing an audio piece while playing on air.

The triple play and dual output capability of the Digilink III makes it ideal for very sophisticated Live On Air operation -and- makes it capable of operating an On Air & Production studio from a single workstation. For fast and complex live on air applications, the DL3 can play 3 files at once so that you can lay down a bed, play a phoner, and drop in a sound effect at the same time. Or, you can be playing on air with crossfade while independently recording, playing, and editing a phoner.

A unique capability of Digilink III is its ability to operate two studios from a single workstation. The most common application would be to use one workstation for both on air and production studios. The DL3 is placed in the production studio while a PCAT computer running Arrakis remote control software is placed in the on air studio.

The production studio has complete single play-record-edit capability while the on air studio can independently use dual play for on air. While not a redundant system, it does provide a dual studio workstation solution for under \$11,000.

To make the DL3 even more easy to use for air, a 99 button Gemini control panel can be added to the system for only \$1,195. It places hundreds of carts at the jocks fingertips and the files assigned to each button change to support up to 40 different jocks. The Smart*Record feature of the controller even allows you to record a phoner at the push of a button. The DL3 will automatically trim the front and end of the phoner, and then you just push the button again to play it to air. The Gemini control panel makes the Digilink III workstation fast and easy to learn and use.



The 99 button Gem-6CC control panel places hundreds of carts at your fingertips for only \$1,195



The 22,000 series console integrates the 99 button Gemini control panel into an easy to use console

The powerful Digilink III is fully compatible with Arrakis Digilink II and Trak*Star workstations so that it may be easily added to an existing network.

Call now to find out how this amazing new workstation can be made to work for you.

for more information call... (303) 224-2248

in some areas, call (970) 224-2248

Sale !!!

DL3-600

\$7,995

(a \$9,995 value)



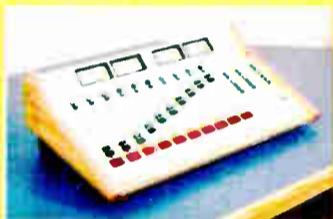
arrakis
SYSTEMS INC.

2619 Midpoint Drive, Fort Collins, CO. 80525
Voice- 303-224-2248, Fax- 303-493-1076

Audio Consoles

The standout #1 leader in reliable, high performance, digital ready consoles for radio, Arrakis has several console lines to meet your every application. The 1200 series is ideal for compact installations. The modular 12,000 series is available in 8, 18, & 28 channel mainframes. The 22000 Gemini series features optional video monitors and switchers for digital workstation control.

1200 Series Consoles



1200-5	Five ch	\$1,795
1200-10	Ten ch	\$3,495
1200-15	Fifteen ch	\$4,995

12000 Series Consoles from \$3,995



22000 Series Consoles from \$6,995



Digital Workstations

#1 in digital workstation sales, Arrakis has over 1,600 workstations in use around the world.

As a multipurpose digital audio record-play workstation for radio, it replaces cart machines, reel machines, cassette recorders, & often even consoles. Digilink has proven to be ideal for live on air, production, news, and automation applications. Place a workstation in each studio and then interconnect them with a digital network for transferring audio, text, & schedules between studios. Arrakis is the #1 choice of broadcasters.

Satellite Automation



CD Automation



Use for Live On Air, Automation, Production, News & Scheduling



Digilink & Trak*Star Workstations

Studio Furniture

With over 1,000 studios in the field, Arrakis is #1 in studio furniture sales for radio.

Using only the finest materials, balanced laminated panels, and solid oak trim, Arrakis furniture systems are rugged and attractive for years of hard use.

Available in two basic product families with literally thousands of variations, an Arrakis studio furniture package can easily be configured to meet your specific requirement, whether it is simply off the shelf or fully custom.

Call Arrakis to find out how easy it is to design and build your next studio.

Desk*Star studio furniture systems



Modulux studio furniture systems

Complete systems...

As illustrated in the Sony Worldwide Networks master control studio on the right (one of seven Arrakis studios in the Manhattan, New York complex), Arrakis can provide complete major market studios with Arrakis consoles, digital workstations, video-audio switchers, furniture, and system prewiring.

With a choice of several console lines; digital workstations for live air, production, news, and automation; and two major studio furniture product lines, Arrakis can meet broadcasters needs from the compact news studio to the major market network origination center. Complete Arrakis equipped studios can be found around the world from Tokyo, to Moscow, to Japan, to Tahiti. Call Arrakis today for your equipment or studio needs.

Sony Worldwide Networks
Manhattan, New York



Comedy Duo Benefits Early Radio

by Bob Rusk

SEASIDE, Ore. George Burns and Gracie Allen, one of the most popular husband-and-wife comedy teams, pulled in huge ratings for both CBS and NBC throughout the 1930s and '40s. They made their radio debut, however, across the Atlantic on the BBC. While making personal appearances in London, they received an offer to do five broadcasts.

"We didn't take radio too seriously then," Burns said in one of the many interviews I've done with him. "But what did impress us was the extra 100 pounds they offered us, so we accepted. They wanted us to do six minutes. At that time there wasn't a network, so we did the same routine on all five broadcasts."



George & Gracie in Their Prime

The first broadcast was heard in London. The second one was heard in Manchester, the third in Bristol, the fourth in Blackpool, and the fifth in Glasgow.

"What really surprised us," said Burns, "was the number of people who heard those broadcasts. We may not have been impressed with radio at first, but that quickly changed.

"I couldn't wait to return to New York. I thought if the radio audiences liked us in America as much as they did in England, there would be no telling how far Gracie and I would go in this new

CLASSIC BURNS AND ALLEN

GRACIE: On my way in, a man stopped me at the stage door and said, "Hiya, cutie, how about a bite tonight after the show?"

GEORGE: And you said?

GRACIE: I said, "I'll be busy after the show but I'm not doing anything now," so I bit him.

GEORGE: Gracie, let me ask you something. Did the nurse ever happen to drop you on your head when you were a baby?

GRACIE: Oh, no, we couldn't afford a nurse. My mother had to do it.

GEORGE: You had a smart mother.

GRACIE: Smartness runs in my family. When I went to school, my teacher was in my class for five years!

thing called radio!"

Burns and Allen were heard stateside for the first time the following year, 1931, as guests on crooner Rudy Vallee's "Fleischmann Hour." Then in 1932 they teamed up with bandleader Guy Lombardo on "The Robert Burns Panatela Program" (named for the cigar company sponsor).

Joint remotes

This show is considered the first broadcast to regularly use joint remotes, with Burns and Allen in one city and Lombardo broadcasting from another location much of the time.

The next season Burns and Allen finally got their own show, which ran until 1950. Gracie was the quintessential scatterbrain, with George perhaps the best straight man in the history of radio. It was the perfect combination.

George and Gracie were both veterans of vaudeville before their radio careers. She was a dramatic Irish actress and he was a struggling comedian. At that time Burns was making very little money, but he was in show business and that was all that mattered.

"You see, I was a success even when I was a failure," he said. "I was in love with what I was doing. But I didn't make

it until I met Gracie. I had done all kinds of acts, and they all went no place. But the minute I met Gracie ... Gracie was a big talent."

Burns, who celebrates his 100th birthday in January, was 27 when he was introduced to Gracie.

Backstage meeting

"She came backstage to visit some girl," he said. "I was playing a little vaudeville theater and her girlfriend was on the bill. I was working with some other guy, doing a lousy act. We split up after we played three days.

"Gracie was out of work and her friend said, 'Those two guys, they're splitting up. Why don't you go out front. Maybe you'd like to work with one of them.'

continued on page 45 ►

Getting your

network

up and **running**

doesn't take a

rocket scientist.

Or does it?

Radio and rocket science. If you never exactly thought the two belonged in the same sentence, consider this: our satellite services can help you get your network underway. That's because in addition to providing satellite space segment, we can also supply a **transportable uplink**. Our C-band, Single Channel Per Carrier space on Galaxy IV allows you to control all your network broadcasts from **a single location**. Plus, it's known for its reliability and flexibility, providing digital or analog audio. And, it's all brought to you by the **radio-only experts** at NPR Satellite Services. You don't have to be a rocket scientist to see the benefits. Call us today at (202) 414-2626.

 **NPR Satellite Services®**
Link up with us®

635 Massachusetts Ave., NW., Washington, DC 20001-3753 • (202) 414-2626

► continued from page 29
football and basketball assignments.

For more information, contact Charles C. Coane, Sports Byline USA at 800-783-7529; or circle Reader Service 104.

SW Networks Announces Affiliates, Services

NEW YORK SW Networks announced the start-up affiliates for its new Alternative Rock Network. Affiliate line-up includes WHFS(FM) Washington, KDGE(FM) Dallas, WEND(FM) Charlotte, WRCX(FM) Chicago and KSHE(FM) St. Louis.

SW Networks offers affiliates programming services in the areas of Country, NAC, Urban, Talk and Alternative. Like all of SW's programming services packages, The Alternative Rock Network includes a daily show prep text service

written especially for each format and aimed at providing on-air staff with both comic material as well as the latest and hottest celebrity and world news. Affiliates also receive satellite delivered Entertainment News audio and text services containing entertainment features with celebrity soundbites and quick read newsbites taken live from the front row, backstage, cyberspace and Hollywood, as well as a genre-specific Music News audio and text service.

Programming services packages also include SW Production CDs which are a collection of exclusive, original music beds, sound effects, stingers and punctuators—in short, everything affiliates need for commercial, promotional and programming production. Affiliates also receive SW Biostats, which are edited artist bios that provide bullet-pointed, compelling copy for on-air use, and SW

Newsclips, a clipping service that combines the latest offbeat music news with radio-ready stories that are interesting, odd and outrageous.

For more information, contact John McKay, SW Networks, at 212-833-5636; or circle Reader Service 131.

Radio Show Celebrates Fourth Anniversary

NEW YORK The Sports Collector's Radio Show, the first and only internationally syndicated radio program devoted exclusively to sports collecting, celebrated its fourth anniversary on Oct. 29. The show is now aired on 116 stations in the United States and Canada.

The Sports Collector's Radio Show can now be heard anywhere, whether or not your local radio station airs the show. The program has become one of the first and

only worldwide syndicated radio shows. It is now broadcast in RealTime Audio on the Internet (<http://www.worldlink.ca/KOOLCFRA/>). Anyone in the world can listen in live if he or she has a computer, modem and speakers.

Giveaways are a major attraction of the program. During each show over a dozen boxes of new trading cards, autographed baseballs and other collectibles are given away to lucky listeners. The combination of the giveaways, the call-ins and the top hobby and sports guests keep the show fast-moving and fun to listen to.

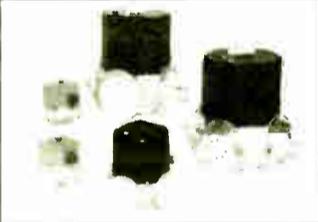
The Sports Collector's Radio Show is broadcast live via satellite and the Internet from New York every Sunday from 8-10 p.m. EST.

For more information, contact Joe Rashbaum or Kristen Speranza, Raybin Communications, at 212-573-8100; or circle Reader Service 32.

Products & Services Showcase

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

FREE*



WHY NOT SWITCH TO MCI?

• QUALITY	• PRICE - 7/8" -	\$2,450
• DELIVERY	- 1 5/8" -	\$2,800
• RELIABILITY	- 3 1/8" -	\$3,600
• PERFORMANCE	- 4 1/16" -	\$5,000
• BROADBAND	- 6 1/8" -	\$6,200
• COMPACT SIZE		

Control Panel also available upon request.
*Shipping in Continental USA-Regular ground service - Switches only

For More Information Call:
MICRO COMMUNICATIONS, INC.
P.O. Box 4365 • Manchester, NH 03108-4365
Toll Free: 1-800-545-0608 • Fax: 603-624-4822



READER SERVICE NO. 118

Custom!

Shively FM Antennas offer standard features often unique in the industry:
Custom-designed stainless steel mounts, included as standard equipment on Shively commercial antennas, ensure a secure and exact interface between the antenna and its support structure. Unlike others who use pieces of chain and "J-bolts", Shively's custom approach assures you of an installation that goes together right the first time, with a minimum of rigging time, and stays that way! Watch future issues of **Radio World** for other unique Shively features.

Shively Labs
A Division of Howell Laboratories, Inc.
19 Harrison Road, Bridgton, ME 04009
207-647-3327 FAX 207-647-8273

READER SERVICE NO. 6

TOWERS By LAROUGE®



In a world full of excuses, all that counts is what you can have done properly. LAROUGE CAN DO IT... WELL!

Manufacturers of self-supported and guyed towers up to 1200' high! Everything is hot dipped galvanized and engineered for prescribed load.

LAROUGE is also located on the perfect center of the Americas, near Miami, Florida. We are waiting to hear from you!!

246 SW 4th Avenue
Homestead, Florida 33030
In FL 1-800-523-3870
Fax 305-245-8119
Outside FL 1-800-624-7612

READER SERVICE NO. 21

ARE YOU LOOKING FOR A COST EFFECTIVE ALTERNATIVE TO MANUFACTURER SERVICE?

SERVICE, REPAIR & CALIBRATION

- STL's • RPU's • TSL's
- Exciters • AM/FM
- Broadcast Monitors •
- Remote Control Systems

SPECIALIZING IN EQUIPMENT BY

- Belar • Marti •
- Moseley • McMartin
- TFT • And others...

An authorized TFT service center

IN CASE OF EMERGENCY

We can help get you back on the air with our STL Loaner Program. We have STL's available that will be set to your frequency prior to shipping. We also provide over-the-phone technical assistance.

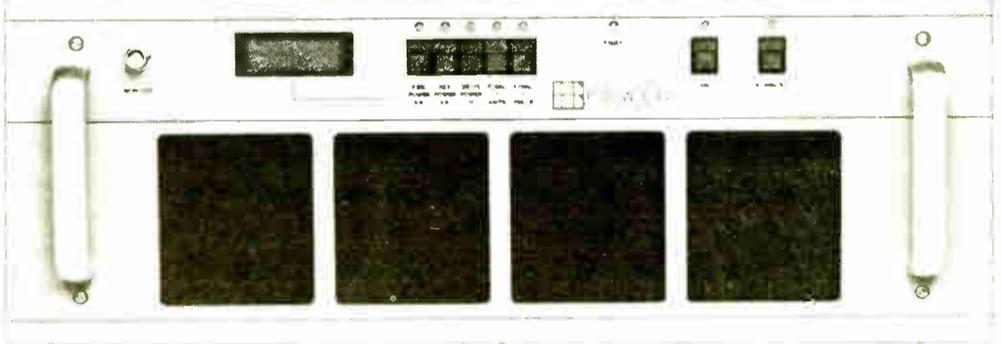


2198 Hubbard Lane, Grants Pass, OR 97527

(503) 471-2262

READER SERVICE NO. 71

B-SERIES FM BROADCAST POWER AMPLIFIERS



Reliability through design is the key to the B-series power amplifiers

Silicon Valley POWER AMPLIFIERS
The RF People

Silicon Valley Power Amplifiers, a quality supplier of OEM modules is now producing a range of compact power amplifiers. All units are complete with rack slide ready to install in a 19" rack system.
Power outputs 150W to 1250W

For prices and delivery CALL 1-800-986-9700

READER SERVICE NO. 213

MANAGER'S NOTEBOOK

Solving Crises with Team Management

Handling Unexpected Crises Reveal Management Styles That Work and Those That Aggravate Problems

by Sue Jones

BURKE, Va. You have heard the saying: "When the going gets tough, the tough get going." Broadcast management is one of the best places to apply it.

Think back over the last three months of your station's operation. Was there a time when the workload on one or more of your staff members was heavier than normal? Perhaps a jock had just quit and you had to ask some of the other jocks to handle extra hours on the air or handle an additional remote broadcast until another jock could be hired.

Your engineer may have been working with four hours of sleep for a week because in addition to handling his routine duties, he was on call 24-hours-a-day, handled a power failure at 1 a.m. and installed a new telephone system that had to be ready by an inflexible deadline. Maybe your sales manager was out for a week because of the unexpected death of an immediate family member.

How did you (or how would you) handle these situations? Some real-life examples that I have observed include:

- barking orders at employees to work longer hours with fewer breaks to cover the workload of a missing employee
- telling staff members to work extra hours or assume extra duties with no additional compensation
- telling an employee who has worked several hours overtime in a week that he must be present at a staff meeting at 9 sharp the next morning
- ignoring the problem and assuming that everyone will make the necessary adjustments and be glad they are employed.

Making sacrifices

Put yourself in the employee's position and consider how you would feel if you were on the receiving end of any of the above examples. If you had vacation plans made with non-refundable airline tickets for the family, you might be forced to pay a large penalty or not receive any money back for the tickets if you could not use them.

Not only would you lose the money, but your family would have to reschedule the vacation. This might become more difficult if your spouse also works and would have to reschedule vacation time with his/her employer. You think, what heartless general manager would do that to employees?

The sacrifice for the employee may not involve rescheduling a vacation, but it might mean that someone misses a parent/teacher conference, a Little League game, a promised long-awaited weekend get-away with the spouse, or rescheduling medical/dental appointments.

No matter how understanding the employee may be about the reduced staff level and the need to provide some extra help in this situation, there will most likely be some adjustments by the person

and/or the families.

Typically, general managers do not have new staff members ready to start the day a key person leaves the station. The standard two week notice of resignation is inadequate for recruiting and hiring a new staff member. In the best of situations, you may have two to four weeks after the resignation date before a replacement can be found for a key employee. Finding yourself short-staffed is not unusual.

Different approaches

Getting staff members to do additional tasks to fill in for that missing person, even for a short period of time, will depend on how professional you are in your approach. Here are some ideas of how you might handle staff shortage situations.

1. Pitch in and do some of the work yourself if you have the skills. You may have to work some additional hours, but that is what you are asking your staff to do. Spend three hours pulling a weekend board shift, if you are comfortable with that task. Make some sales calls. Answer the telephone.

There are several benefits to this approach. You keep in direct touch with the station's positions and have real-life experience in doing those tasks. This is always a good idea even in smooth operating periods. It will be less costly because you will be doing the work and will not be paying someone else to do it. Moreover, your employees' opinion and respect for you will skyrocket. The employees will be more willing to work longer hours because they will see you contributing extra hours and work to help get the job done.

2. Provide extra compensation for those staff members who work extra hours when the staff level is low. Money will not make up for lost time at a Little League game, but will help offset losses for canceled reservations and perhaps pay for tickets to the pro-game to make up for the lost quality time when your employee could not accompany a child on a scouting campout.

Extra compensation

Compensation could take several forms. You could offer additional time off after the crisis period has passed. You could

you just lost your receptionist or office manager, you could contact a temporary employment agency for a receptionist or accountant. If you experience an overload of technical problems or are upgrading equipment, several major markets have contract engineering firms to handle the overload or fill in temporarily and as reserve support for your engineer. Some stations are out-sourcing engineering on a permanent basis.

This is not an exclusive list of ways to get the job done when the management task of covering all of the work gets tougher than normal. It should, however,

Typically, general managers do not have new staff members ready to start the day a key person leaves the station.

give the employee(s) trade items. Additional overtime pay or bonus money for duty above and beyond expectations would be another form. You could also offer the employee(s) who provide the additional time a choice of their preferred extra compensation.

One person may find the extra money useful while another would like additional time off. One "sales approach" that I have used successfully is to ask the staff in a meeting, "Who would like to earn some extra money, double time pay for the next two weeks for overtime?" Needless to say, I had several volunteers.

Hire temporary help

3. Hire the needed workers from a temporary agency or professional firm. If

get your creative mind thinking of better ways to handle nightmare staffing problems and keep your station operating smoothly while supporting the staff who keeps you on the air.

Note: If you would like to share some creative management approaches that you have successfully used for this type of problem, fax the information to me at 703-323-8942 or leave the information on my voice mail at 703-323-0491. Please remember to identify yourself and give your telephone number with an area code in case I need more information about your message.

□ □ □

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

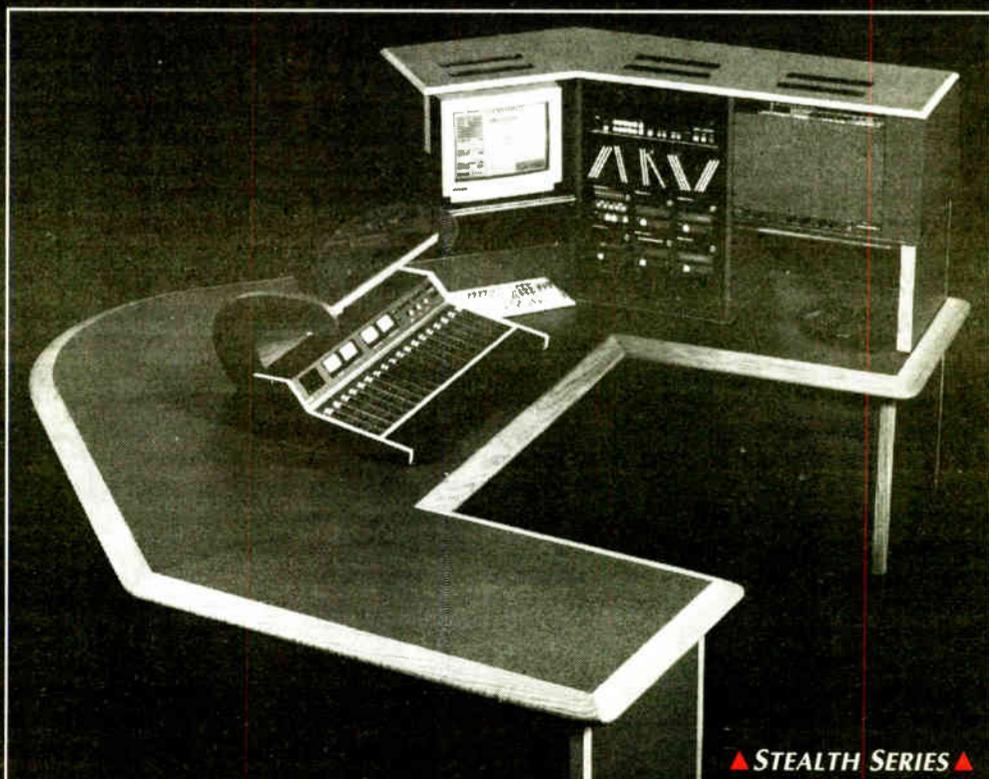
THE SECRET'S OUT—DIGITAL FURNITURE

**MODULAR
FLEXIBILITY
WITH A
CUSTOM FIT**

*We Offer Six Elegant
Lines of Studio Furniture*

4153 BONITA STREET
SPRING VALLEY, CA 91977
PHONE 619/698-4658
FAX 619/698-1268

MURPHY
STUDIO FURNITURE



▲ STEALTH SERIES ▲

Circle (148) On Reader Service Card

Irreverence, Intrigue, Ingenuity on the Net

by Alan Haber

ALEXANDRIA, Va. It has been a wild, wacky couple of weeks here at the plush, spacious, generally hipper-than-it-has-a-right-to-be *Haber Space* Global Headquarters, what with the mandatory post-NAB period of getting used to being back on *terra firma* (read: off airplanes for awhile).

There has also been a flurry of activity on the Web that has caused me to nearly overload and stare with vacant eyes into my computer monitor as I look at some psychology professor's photos from his vacation in Switzerland for the 99th time.

Oh yeah, that's the problem. I've been goofing off. Oh, well. I'm back. And I've got a whole buncha stuff to share with you, not the least of which is this month's Neat-o Site of the Month.

Neat-o Site of the Month? Yeah, neat-o. It's not just "neat" anymore. In honor of this month's winner, I've decided to rechristen the "Neat Site of the Month" the "Neat-o Site of the Month." Believe me — when you lay your eyes on Sanford, Maine, classic/contemporary rocker WCDQ-FM's Web site at <http://www.wcdq.com> "neat-o" will be about the only thought that will spring to mind.

WCDQ, known as Mt. Rialto Radio,

pulsates with "Real Rock 'n' Roll." The station's cool site is heightened by a generous dollop of irreverence and peppered by a good measure of marble (in the background, that is).

The offbeat station profile begs more questions than it answers, making the site seem mysterious. For example, reading through the profile, you'll discover that WCDQ broadcasts "from its fog enshrouded peak, 24,000 centimeters above the glittering lights of the city floor." You'll also discover that the station is "near the border, visible only on crystal-clear winter mornings."

You'll also find out that this is one station that means business. According to the profile, the station is "an eclectic, creative brew of the history of rock and blues, served up live 24 hours a day by people who would not work anywhere else. (And probably couldn't get another job.)"

Site visitors can click on four large custom metallic buttons and look at the offbeat station profile, find out about the station's specialty programming, link to a number of "Elegant Sites" and find out about the station's DJs.

By the way, each of the "Elegant Sites," which includes Ticketmaster Online, the Rock 'n' Roll Hall of Fame, and the Boston Red Sox, can be linked to by clicking on some very cool custom buttons that feature colorful logos.

All of this graphic elegance doesn't come without a downside, however. The graphics take a while to load, and I can see how this would turn some people off. Nevertheless, the wait is worth it, and site visitors will be rewarded if they hang in there during the lengthy downloads.

(T.J. Marks, who designed and created WCDQ's site, told me by e-mail that this situation "will be resolved soon.")

Undoubtedly, my newly christened Neat-o Site of the Month!

Since last month's column, I also ran

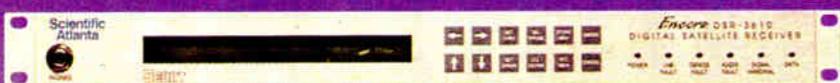


into WAZY-FM's Web site at <http://dcwi.com/~wazy/wazy.htm>

The station is playing "Hits of the '80s and '90s" in Lafayette, Ind. A dynamite design job, with lots of custom (although perhaps a bit too large) graphics and a refreshing sense of humor; for instance, among the large clickable buttons on the home page is one that asks you to "Meet the Airstaff" — and features a photo of the Village People!

I learned a valuable lesson while visiting the Web site of Haverford (Pa.)

continued on page 43 ►



Digital Satellite... The Next Generation

The Encore DSR-3610 Digital Satellite Receiver represents a major achievement in satellite communications technology and can be configured to meet the vast requirements of the nation's broadcasters. It's a continuation of Scientific Atlanta's tradition of pioneering digital audio technology.

Features

- Full transponder format
- Compatible with existing DATS format and the SEDAT™ Algorithm Family
- Transponder and channel agility
- L-band input accepts signal from low cost nonstabilized low-noise block downconverter or C-Band LNB
- One rack unit chassis preserves equipment rack space
- Two channel standard/four channel available
- Used by ABC, CBS, Westwood and many other radio networks



Scientific Atlanta SRC-3550
Satellite Receiver Control Available

1-800-622-0022

FAX 317-966-0623

<http://www.broadcast.harris.com>

**HARRIS
ALLIED**

© 1995 Harris Corp.

Running Radio Marketplace

A Supermarket of Radio Station Services

For information on the services shown below, circle the Reader Service number on the enclosed card or contact the advertiser directly.

NASHVILLE
Record Review
CROOK & CHASE

COUNTS DOWN COUNTRY'S TOP 40

THE NASHVILLE RECORD REVIEW, HOSTED BY LORIANNE CROOK AND CHARLIE CHASE OF TNN'S MUSIC CITY TONIGHT, IS ONE OF RADIO'S FASTEST GROWING COUNTRY COUNTDOWN SHOWS.

A FOUR-HOUR WEEKLY SYNDICATED RADIO PROGRAM PRODUCED ON COMPACT DISC.

FOR MORE INFORMATION CONTACT

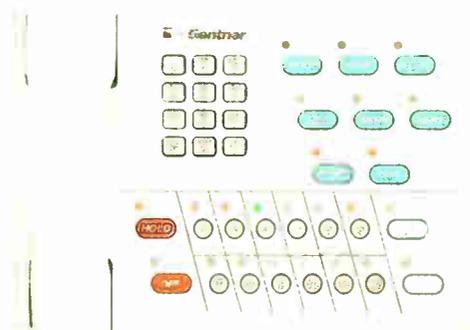
EAST: FRANK IACONA,
(203) 965-6217
WEST: CRAIG CHAMBERS,
(303) 771-9800

Reader Service No. 23

ABOUT THE ONLY THING
IT CAN'T DO FOR
YOUR TALK SHOW HOST IS
MAKE EVERY
CALLER SOUND
INTELLIGENT.



Occasionally, every talk show has to deal with an out of touch caller. But that's probably not the worst of your talk show host's problems. Chances are, your host is also trying to screen calls, conference multiple lines and make smooth transitions to commercial breaks – all while trying to come up with a snappy comeback for the space cadet on line 3. That's why we've updated the old talk show phone with the TS612. All the important functions are clearly marked and the phone lines color coded to make on-air decisions hassle free. Want to screen calls? Press **SCRN**. Want to conference up to four lines? Press



THE TS612 HANDLES
UP TO 12 PHONE LINES.

CONF. Don't want to lose a very important caller? Press **VIP**. Your host can even call for pastrami on rye while on-air some caller explains the finer points of cloud-watching. The point is, the TS612 is simple, versatile and lets your host concentrate on the show rather than the phone system. To find out more, call us.

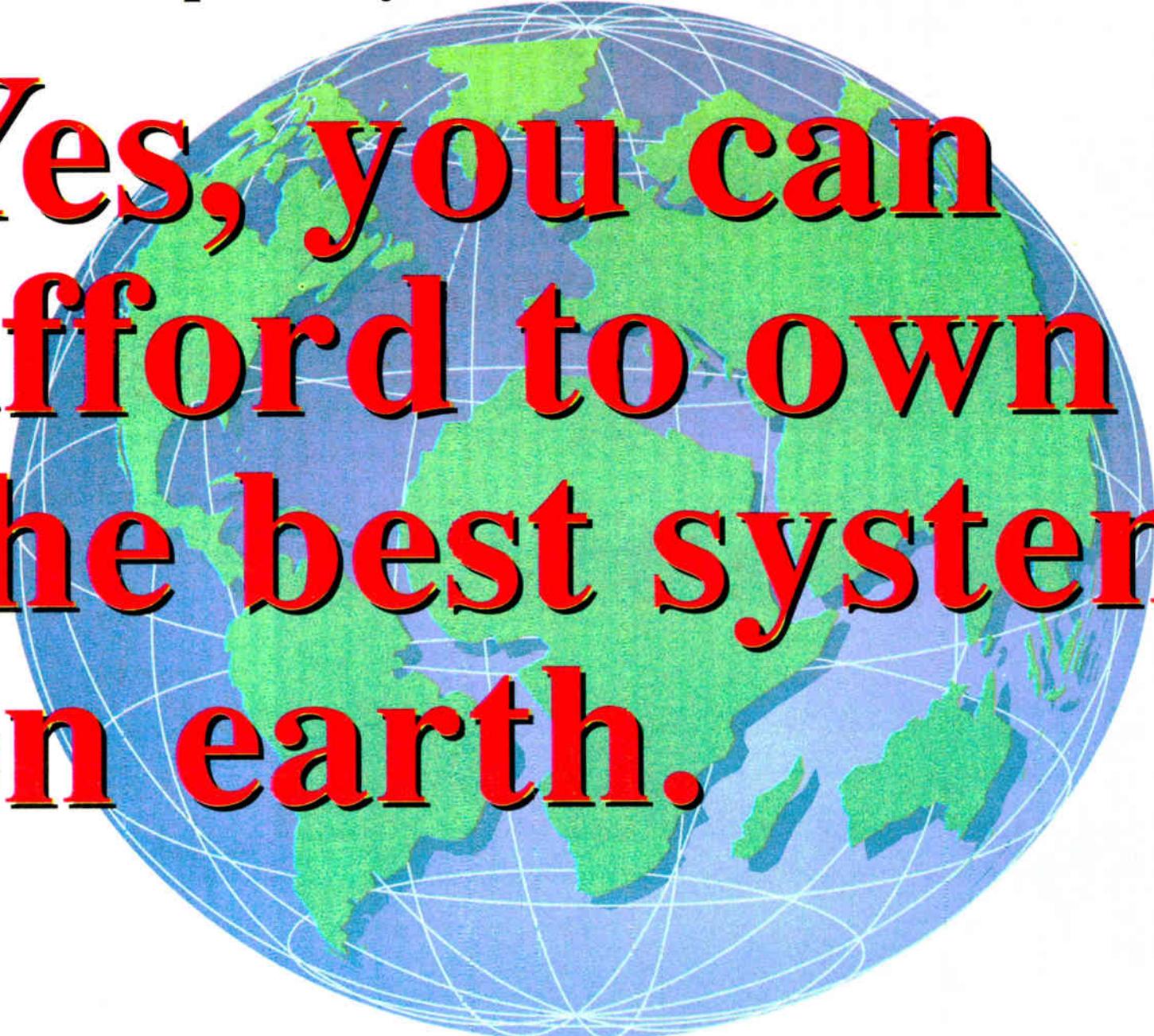
 **Gentner**

1 - 800 - 945 - 7730

OR 1 - 801 - 975 - 7200

Circle (197) On Reader Service Card

Prophet Systems Inc. announces



**Yes, you can
afford to own
the best system
on earth.**

Now you don't have to settle for that cheap system, because you think you can't afford an Audio Wizard™. Our superb quality Pentium based digital systems are now available in all price ranges!!

**WE NOW OFFER A FULL
LINE OF PEER TO PEER
AND CENTRAL FILE
SERVER SYSTEMS.**

**SINGLE STATION SYSTEMS START AT
\$7950 !**

(Includes modem, remote control software, networking, cut and paste editing, Dolby audio. Standard features the other systems call "options.")



Audio Wizard™ for Windows™

The *Flexible* Digital Automation System featuring Windows and Novell Technology

Windows is a Registered Trademark of Microsoft Corporation. Novell is a Registered Trademark of Novell, Inc. Intel is a Registered Trademark of Intel Corporation.

You asked us to build our high

Whether you're a small station looking for peace of mind, or a huge broadcasting operation looking for an economical and efficient way to run four or more stations, we have your system. With Audio Wizard™ XPS for Windows, you get the quality of our world class Audio Wizard CFS for Windows at a price you'll love. Start out with one control room, and we'll expand with you. From one workstation to fifty—we can handle it. You can't buy a better system at any price. Now they can't even claim they cost less. Why buy any other system, when you can buy the best system on earth!

quality system to compete with

- ◆ Pentiums on every workstation!
- ◆ New, high quality computers with three year factory warranty!
- ◆ Live, satellite, and automated modes!
- ◆ Backtime system, fills out each hour!



those low end systems.

- ◆ Automatically record and play network feeds!
- ◆ The leading hard drive music automation system in the industry!
- ◆ Unsurpassed flexibility, runs any program or music log!
- ◆ On-line copy system, integrate your stations!

So we did! The new Audio

- ◆ Exclusive time and temperature announce!
- ◆ Novell, the number one network!
- ◆ Replaces carts, reels, CD players!
- ◆ Uses Windows for the ultimate in multi-user, multi-tasking, realtime operating systems!

Wizard™ XPS for Windows.

- ◆ Dolby stereo—standard!
- ◆ Button bar with quick record capabilities!
- ◆ Uses non-proprietary equipment!
- ◆ Global and/or individual song and spot crossfades!

Fear no competition!

Find out why Audio Wizard™ for Windows is the fastest growing digital audio automation system in the world. Call for information or a free demonstration. **Let us help you slay your dragon.**

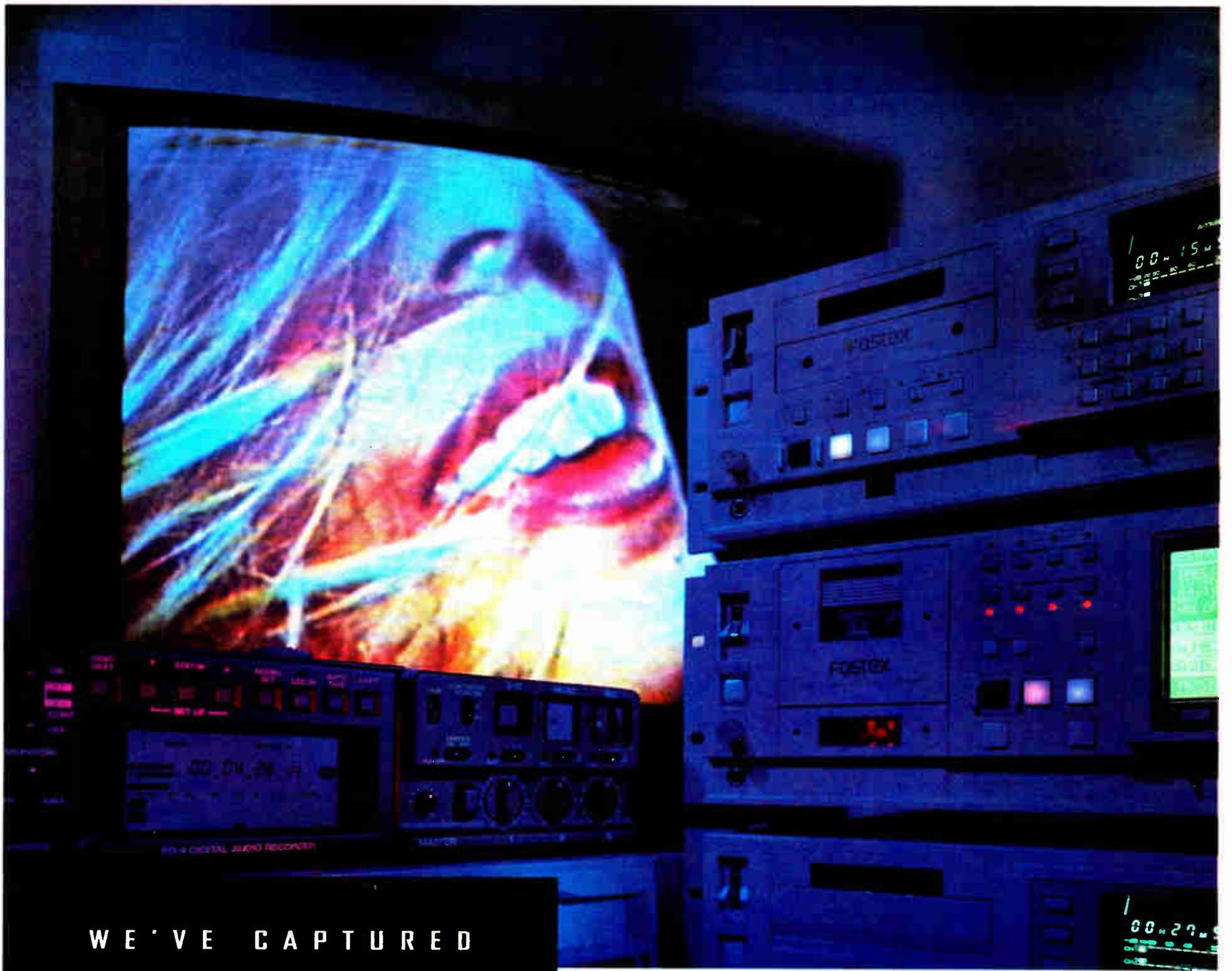
Prophet Systems, Inc.
1-800-658-4403

Southwest: 800-914-9273
South: 214-771-1008
Northwest: 503-773-5731
In Australia, New Zealand, and Pacific Rim, contact
Broadcast Solutions Pty Ltd. at (02) 439-6662.

Circle (214) On Reader Service Card

World Radio History





WE'VE CAPTURED
 EVERYTHING FROM
 CRASH CYMBALS TO
 SEX SYMBOLS.

In this business timing is everything. Which explains some of the success behind our industry-leading lineup of SMPTE timecode DAT machines. Of course, mass appeal doesn't hurt either. So if you're looking for outstanding value, you'll find it in our **D-10**, the most affordable timecode DAT recorder on the

market. If you need a full-function chase/lock machine, you'll appreciate our **D-25** with RAM scrubbing and Sony® P2 protocol for serial editing control. Our **D-30** represents the pinnacle of DAT technology, with its remarkably user friendly nature and renowned intuitive display screen.

If multitrack is the issue, our **RD-8** is the machine of choice. And when it comes to portable recording, nothing keeps up with our second generation **PD-4**'s unparalleled ease of operation and 3-channel mixer. Want to know more? Simply call Rick Cannata at **800-9-FOSTEX**. You'll see why—

from music tracks to soundtracks—we've developed a following that stretches from Nashville to Hollywood.

Fostex



D-10 Production TC DAT Recorder



D-25 Studio TC DAT Recorder



D-30 Master TC DAT Recorder



RD-8 Digital TC Multitrack Recorder



PD-4 Portable TC DAT Recorder

Fostex Corporation of America 15431 Blackburn Avenue, Norwalk, California 90650, U.S.A. Telephone: (310) 921-1112 Fax: (310) 802-1964

Circle (137) On Reader Service Card
 World Radio History

Intrigue on the Internet

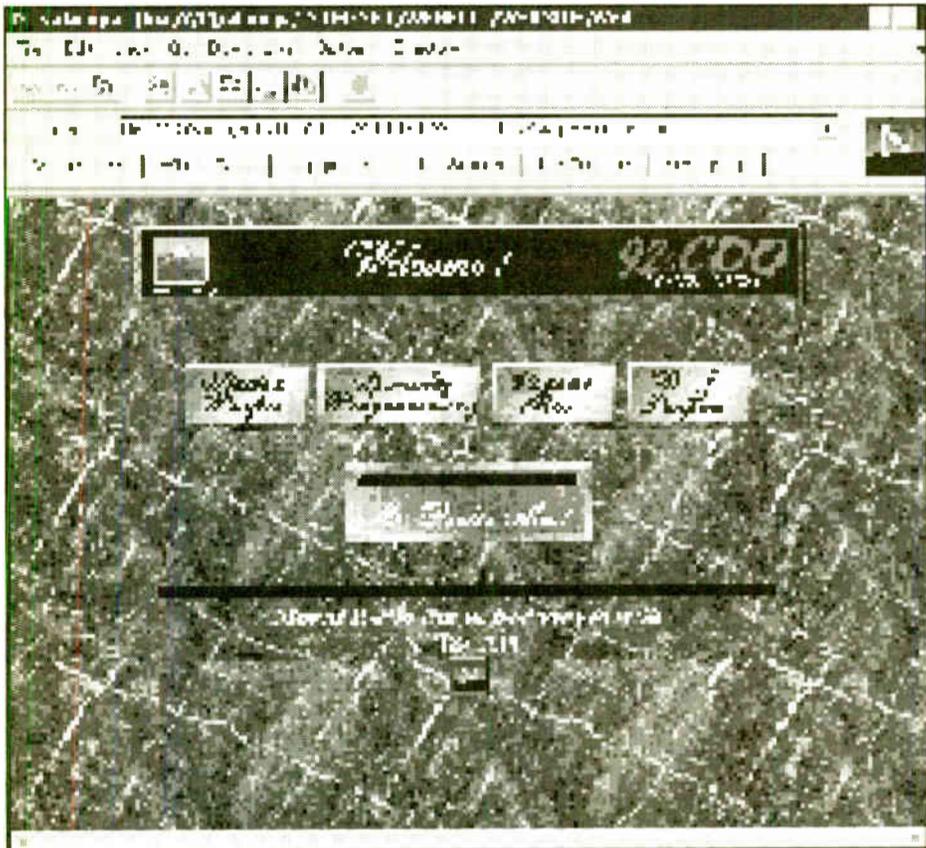
► continued from page 38

High School's radio station, WHHS-FM at <http://www.netaxs.com/~dbrouda/whhs/> I shoulda paid more attention in class!

What a nice site. Browsing through the pages, you find out that the station started in 1949 "as an experiment in radio electronics" at the school. Principal Oscar

to the backgrounder on the site. "The experience gained from WHHS is priceless," and some of the station's DJs now work for commercial radio stations around the country.

WHHS's format is basically alternative, but the station does broadcast specialty shows and a news program called "Haverford Happenings."



WCDQ's Site of the Month

Granger got a license from the FCC. The station changed frequencies from 89.3 to 107.9 in 1992; it covers a 5-10 mile area and boasts an audience of around 700 people.

Students who go on the air have to get an FCC license, use the necessary equipment and "organize air time." According

This is one cool cyberstop, folks. I hope to have more about it for you next month.

Airwaves

I've probably been remiss in not mentioning the wonderful Airwaves Media site at <http://radio.aiss.uiuc.edu/>

[~rrb/index2.html](#)

Jam-packed with solid information, it came out of the Airwaves Radio Journal, an Internet 'zine covering radio. The site also compiles messages from the rec.radio.broadcasting Usenet newsgroup, which I'm sure all *Haber Space* readers congregate at every once in awhile.

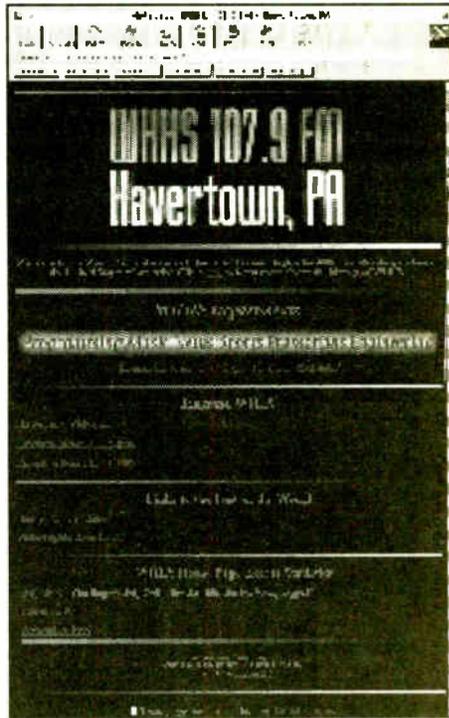
Anyway, the site has back issues of the Journal, loads of links to radio stations and networks and such, and even television links (you know — radio with pictures, as William Pfeiffer, who doubles as the rec.radio.broadcasting newsgroup's moderator, says). You can even choose to search the FCC's AM radio database at <http://radio.aiss.uiuc.edu/~rrb/fccdb.html>

The mailbag

I heard from Paul Nixon, production director at CHR Power 103 and country Y-99 in Abilene, Texas. Paul wrote to say he enjoys reading *Haber Space* - thanks for the kind words. I checked out your sites (Power 103 is at <http://www.abilene.com/power103.html> and Y-99 is at <http://www.abilene.com/y99/index.html>) and liked what I saw: loads of links and lots of station information, including DJ pix and bios. Check 'em out, pardners.

Gary Johnson, who calls himself "an old radio guy," dropped me a line. Gary's currently co-owner of the New Work Corporation, which concerns itself with how people work in today's economy (<http://www.newwork.com>). He says he wishes that he had "the resources of the Internet available when I was on the air everyday over a period of many years."

Jerry Burger also wrote me recently:



WHHS' Web Page

he's webmaster of WebOvision. "Providing WWW links to media around the world." This site features, among other things, links to U.S. and world radio stations and programs. Jerry has even included a handy search feature. Check out WebOvision at <http://www.webovision.com/media/>

Time to make tracks and get back to surfen' the Web. Remember: If your station is on the Web, let me know about it, and I'll make mention in this space. I'm at zoogang@ix.netcom.com — 'Till next month, cyberfolk.

STATION/STUDIO SERVICES

427 SOUND EFFECTS \$89.00

For a 5-CD set with a 30-day money-back guarantee.

Take an extra \$10 off if you mention this ad!

Send \$79 to Ghostwriters
2412 Unity Ave. N., Dept. RW
Minneapolis, MN 55422

For credit card orders call
(612) 522-6256

READER SERVICE 18

THE BROADCASTER COLLECTION of SOUND EFFECTS!

Over 500 broadcast quality Sound Effects on 8 CDs
Organized by subject!

Animals - 93 Tracks Backgrounds - 47 Tracks
Transportation 1 - 51 Tracks Military - 92 Tracks
Transportation 2 - 69 Tracks Environment - 50 Tracks
Machinery - 58 Tracks Household - 38 Tracks

All 8 for ONLY \$150.00! ORDER TODAY and receive FREE our 2 Volume VOICES OF HISTORY CD with more than 49 analog speeches from the past!

CREDIT CARD ORDERS - CALL TOLL FREE

Satisfaction Guaranteed!

VALENTINO MUSIC

500 Executive Blvd. Lindsford, NY 10523
800-223-6278 FAX 914-347-4764

READER SERVICE 41

BUY-OUT MUSIC — \$99

Sixty 30-second music beds for ... \$99
198 :30 & :60 music beds for ... \$193
120 production effects "Zings, Zaps and Zoodads" for ... \$99
122 New Lasers & Sweepers for ... \$99

For FREE DETAILS on production music, sound effects, call

.....
Ghostwriters (612) 522-6256

READER SERVICE 18

Retail Client JINGLES: \$950!

Complete packages with multiple :30 & :60 cuts
Buy Out: NO yearly renewal or leasing required

Automated Station Services

Complete copywriting & production packages
Award winning writers & creative talent on staff

Now radio stations and their clients in the smaller markets can have that major market sound...without the major market price.

Call for your FREE DEMO TAPE today!

EZ SOUND IDEAS!

Call 1-800-IDEAS-83 NOW!

READER SERVICE 76

ATTENTION PROVIDERS!

Promote your services to **Radio World's** 18,000+ readers. Reach Radio Station and Recording Studio owners/managers and engineers with your message. For information on affordable advertising call **Simone** at **1-800-335-3045**.

LET YOUR TOWER PAY YOU

Signal One can locate tenants, execute lease agreements, & manage your tower site to produce revenue you never realized was available.

Signal One manages and owns communication sites throughout the USA and has a large customer base that includes BellSouth, PageNet, PageMart, Federal Express, motorcarriers, and other financially-sound users that can help you enhance your operations.

Call Signal One today... and let us demonstrate how we can fill your tower site with tenants.

Fax your tower site information to **(423) 954-3222**. We will include your information in our nationwide site database for our many customers to utilize and lease on.

SIGNAL ONE
"One Call and Your Signal Is On"™
(423) 954-1111
5700 Brainerd Road, Uptain Building, Suite 407
Chattanooga, TN 37411

Circle (165) On Reader Service Card

Products & Services Showcase

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

Don't let their size fool you.

STEREO HEADPHONE AMPLIFIERS



HD-1000 MASTER

- Drives Four Independent Headsets
- High Output for 8 to 600 ohm Headsets
- Stereo Balanced Line Inputs
- Panned Microphone Input for Announcements
- Stereo or Left Only-Mono Output
- Balanced Line Out to HD-100
- Half Rack or Desk Mount

HD-100

- Drives Single Headset
- High Output for 8 to 600 ohm Headsets
- Stereo Balanced Line Inputs
- Loop-thru Inputs Feed Multiple Positions
- AC Powered, Compact
- Ideal for Offices and Study Carrels

CALL OR WRITE NOW FOR FREE DETAILED BROCHURE



AUDIO TECHNOLOGIES INCORPORATED

328 W. Maple Ave. Horsham, PA 19044, USA
(215) 443-0330 • FAX: (215) 443-0394
(800) 959-0307

READER SERVICE NO. 25

The CircuitWerkes TeleRadio Remote Controlled Listen Line



You can find out what's on the air in all of your markets without ever leaving your chair!

With the TeleRadio and a phone, you are ready to check up on your station *and* all of your competitors in real time. You'll never have to get another station air-check plus you can punch around the dial as if you were right there. When the TeleRadio answers, its internal radio begins playing down the line to you. You control the tuner with the buttons on your phone. The TeleRadio is the next best thing to being there yourself.

The TeleRadio features include:
Ten random memory presets.
Remote scanning, tuning, band change & memory set.
Remote controlled external audio jack lets TeleRadio double as a standard coupler for H-B, etc.
List price is just \$689.

CircuitWerkes

6212 SW 8th Place
Gainesville, Florida 32607
(904) 331-5999 / fax 331-6999

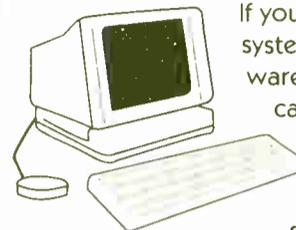
READER SERVICE NO. 26

Can we make you

6db Louder?

(Probably not but...)

We can supply you with all of your computer needs!



If you need computer systems, hardware, software, memory, modems, cables, etc... for *ANY* application (on-air, sales, traffic, etc.) at your broadcast facility... call us!

Broadcast Computer Distributors

1-800-670-2743



(And use the money you save to buy that new processor you've been wanting!)

READER SERVICE NO. 122

ISDN Questions? Get Help, Not Hype!

Call for your free copy

"ISDN - An Unscientific Survey"

Overview of US ISDN providers

and

"ISDN for Broadcasters"

40-page tutorial on ISDN



65 Nonset Path, Acton, MA 01720
Tel: 1-800-237-1776 Fax: 508-635-0401

READER SERVICE NO. 98



Econco REBUILT POWER TUBES



Approximately One Half the Cost of New

3,000 Hour Unconditional Guarantee

Call for Our Price List

Econco 1318 Commerce Ave. Woodland, CA 95695
Phone: 916-662-7553 Fax: 916-666-7760 Telex: 176756
Toll Free: 800-532-6626 From Canada: 800-848-8841

READER SERVICE NO. 27

STAY ON THE AIR ...AND MORE!



Service & Affordable Quality for Over 23 Years

AUTOGRAM CORPORATION

1500 Capital Avenue (214) 424-8585
Plano Texas 75074-8118 1-800-327-6901

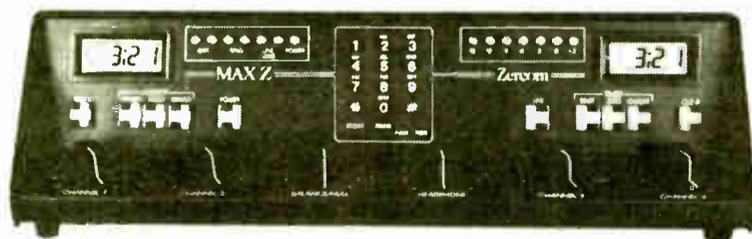
FAX (214) 423-6334

READER SERVICE NO. 3

The best way to *squeeze* a great sound through a telephone line...



You don't have to settle for less than the best!

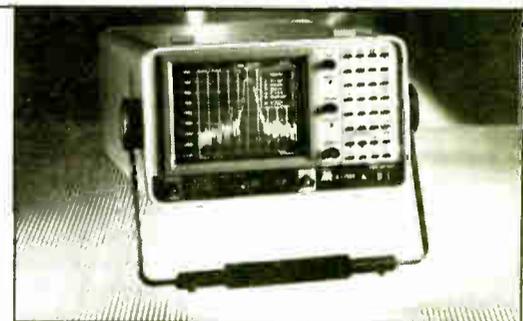


The 'Max-Z' 4 channel remote console

P.O. Box 84, Zercom Drive
Merrifield, Minnesota 56465-0084
218/765-3151-Fax 218/765-3900

Available through all major dealers

READER SERVICE NO. 29



A-7550... 10 kHz to 1 GHz PORTABLE SPECTRUM ANALYZER

Synthesized tuning and phase locked frequency stabilization enable accurate swept frequency measurements over calibrated span widths from as wide as 100 MHz/div to as narrow as 1 kHz/div. A standard 300 Hz resolution bandwidth filter and peak hold mode provide NRSC measurement capability. Other A-7550 features include:

- +30 to -120 dBm measurement range
- DC operation from 12 to 30 volts (*Built-in battery optional*)
- Optional built-in tracking generator
- Optional built-in AM/FM/SSB receiver
- Optional IEEE-488 or RS-232 interfaces

For more information or a demonstration of the A-7550 contact:

IFR SYSTEMS, INC.

10200 West York St., Wichita, Kansas 67215
Phone (316) 522-4981 Ext. 207. FAX (316) 524-2623
DIRECT FACTORY RENTAL PLAN AVAILABLE



READER SERVICE NO. 168

PROMO POWER

Is Logo Redesign Really Necessary?

by Mark Lapidus

WASHINGTON The best logos are simple. The trouble is, it's not easy being simple! Making a logo for a radio station can be a frustrating, time-consuming practice.

I once had a promotion director tell me he needed a new station logo in less than two weeks.

"Two weeks," I exclaimed. "Why so fast?" He went on with a long story about t-shirts that had to be printed for a concert and the due dates for artwork and delivery and you name it ... I stopped him.

"Wait a second...you mean you want to rush a logo that you'll have to live with for the life of the format, all for the sake of a t-shirt?" Upon reflection, logic prevailed and he came to the right conclusion.

File this one away for the next time you launch a new station or decide to modify your current format. A logo is one of the most important decisions you'll make.

Why a new logo? The best reason for a new station logo is that you're signing on a new format. Of course, listeners hear this as a "new station" signing on in their

city. It doesn't occur to them that the same group of people may still own or operate the property. They look at everything as being new.

Why new?

Nothing says new better than an entirely new on-air moniker (new call letters, slogan, etc.), as well as a new logo on everything visual. The only other reasons to alter a logo are: 1) to show a significant alteration in the product; or 2) the logo was awful, unreadable and unrecognizable to your listeners. If you've inherited a logo this bad, you've probably also just taken over a radio station that requires a lot of what I cited in point number one. The worst reason to change a logo is just because you don't like it.

How to start? Begin with a budget. It's not unreasonable to spend \$2,000 to \$5,000 on a totally new treatment. For this amount of money you should see a minimum of eight different treatments and wind up with the finalized artwork on computer disk and in black and white stat sheet form. You should also own the logo. Do not allow the artist to retain

"ownership" based on a discount or enter into an annual leasing situation.

Direction: It will help your artist immensely if you provide him with other logos you like. Don't know what you like? Call any of the many bumper sticker companies and take your pick. Just don't rip off any designs; they're probably registered. If you see one you really like, you may save a lot of time and money just by calling the station to see if it will sell you the design. If you're using this artist for the first time, you should have already reviewed his portfolio to see if you like his approach.

The most prominent item in a station logo should be what you call the station. If you call it "The Pig," then that name had better be the most visible. Don't feel you have to use call letters if you don't intend to use them on-air. You also need your frequency and finally, a positioning statement.

Many stations leave out the positioning statement because they feel it clutters the logo. That may be true if the logo is designed incorrectly. If the design is right, your position (Modern Rock; Country; '70s, '80s, '90s; talk, etc.) will blend with the rest of the treatment. If you don't tell people what format you are, all you're telling them is that you're a radio station. Big deal.

Test it

Put it to the test. A logo is highly subjective. What matters most is what your listeners think. Select a small group of station people: program director, general

manager and promotion director. Narrow it down to three choices. (You need a different group if none of these people fit your target demo.) Take these three choices to a focus group and get their feedback. Yes, everyone can do this type of focus group and it doesn't have to cost a dime.

Go on-air and invite listeners to join you for a logo party. Pick 10 people in your target group and take them out for pizza. Show them the logos and discuss what they like and what they don't. You may learn that they hate all of them and you'll have to begin again. Or, perhaps they like one, but it needs to be modified. You may even wish to show them your chief competitor's logo to discover what advantage it may have over yours.

Once done, your new logo has to go on everything. Don't phase it in gradually on anything highly visible to the public. I'm okay with using up stationary or business cards, if necessary, because so few people see them. However, you shouldn't leave up old billboards, run old TV spots or let your van drive around town with the old look.

Love those logos

By the way, I love looking at new logos. If you've got one in development and would like an unbiased perspective, feel free to send it to me in care of **RW**. I'll give it the once over, free of charge. You may not like what I say, but that's what free advice sometimes gets you. Come to think of it, that's kind of like a focus group. Here's looking at you!

□ □ □

Mark Lapidus is director of marketing for Liberty Broadcasting. Liberty owns stations in Washington; Baltimore; Richmond, Va.; Long Island and Albany, N.Y.; Hartford, Conn.; and Providence, R.I.

Burns and Allen

► continued from page 35

"Gracie watched us work," said Burns, "and liked what I did. We met, started to rehearse on Thursday, and two weeks later we were doing an act together."

Touring in vaudeville, Burns and Allen did the same routine for a year as they traveled by train to theaters in every corner of the country. It was a small audience compared to what they would play to on radio.

"It was the first time people did not have to leave home to see you," Burns said. "You performed for them by coming right into their living rooms. On radio we reached millions of people in one night. But I soon realized that it wasn't us, it was the invention that was such a sensation. If it wasn't for that little crystal set, I'd still be playing Altoona!"

Personal note

George Burns is the first of hundreds of celebrities I've interviewed, and he is still my favorite. The first time we talked I was in college. I had just finished his book "Living it Up," and read that his office was at General Service Studios in Hollywood.

I thought it would be fun to call and say "hi." I got the studio's phone number from information and nervously dialed. The receptionist gave me the direct number to the Burns office. I dialed it, and when his secretary answered I said that I was a college student majoring in radio and admired Mr. Burns.

I was put on hold for a few seconds, then a familiar voice came on the line and said, "Hi, Bob. This is George Burns." At the time, I did not realize that very few stars take calls from fans.

With my heart racing a mile a minute and my palms sweaty I managed to say, "Thank you for taking my call, Mr. Burns."

"Tell ya what, kid," he said, "How about if I call you Mr. Rusk? You can call me George. It makes me feel old when people call me Mr. Burns."

George was a youthful 82 at the time.

We chatted for a few more minutes and he ended the conversation by saying, "Come down to Hollywood and see me, kid. I'll take you out for a drink." He didn't know that I was just 19.

Shortly after that, I went to work at KSWB(AM) in Seaside, Ore. George was one of the first people I called. During my 11 years at the station, he was always happy to do interviews and the listeners loved hearing his wonderfully funny stories. I also spent time with him during my frequent trips to Hollywood.

His friendship gave me confidence as I pursued my dream of a career in radio. For that I say, thanks for being so nice to this kid, George.

FM STUDIES

- ◆ **SPACING/INTERFERENCE**
determines channel availability
- ◆ **DETAILED INTERFERENCE**
short-spaced commercial studies, educational FM studies
- ◆ **DISTANCE TO CONTOURS**
plots projected coverage
- ◆ **POPULATION COUNTING**
determine potential audience
- ◆ **COVERAGE MAPS**
signal coverage, zip code boundaries, ethnic- demographic data, loyal listener locations

Visit Our Home Page At:
<http://dataworld.com/>



800-368-5754 FAX: 301-656-5341
e-mail: Info@dataworld.com

Circle (35) On Reader Service Card

FREE STOCK TIP

Invest in your business news. Call Nasdaq's Stockline for free, ready-to-air stock market reports. Get the latest numbers on the markets and the day's economic and consumer news.

Call 1-800-536-0837

It's updated on the hour and it's absolutely free. If you want, sell the report to a local sponsor. So, give it a listen. Then give us a call to let us know what you think.

Contact Brett, Chuck, or Debbie at 1-800-777-6273.

THE NASDAQ STOCK MARKET
NASDAQ

Circle (117) On Reader Service Card

Products & Services Showcase

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

VACUUM & GAS CAPACITORS



Over 800 Capacitor Models

Voltage Ratings to 100 kV
Variable & Fixed
Vacuum & Gas
Unlimited Capabilities

Applications: Communications, Power, Electronic, Semiconductor Fab, Dielectric Heating Equipment, & Medical MRI & Heart Defibrillators. Ask about our vacuum & gas relays & other components.

JOSLYN JENNINGS CORP.

Phone: (408) 292-4025 Fax: (408) 286-1789

Request a FREE catalog

READER SERVICE NO. 119

Excalibur Electronics CD-1 Interface Amp



The industry's favorite unidirectional interface amplifier is designed to match IHF output standards (10kΩ unbalanced, -10dBV) to broadcast input standards (+4dBm, balanced). DC coupling, <0.006% THD & IMD, and >90dB S/N make the CD-1 appropriate for use with the highest quality CD players, as well as with monitor tuners, cassette and tape playback, DAT playback, and ENG equipment. Table-top mounting or, using the included angle brackets, may be attached to a rack panel, your cabinetry, or anywhere convenient. A dual version, the CD-2, is also available.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA
Please circle our bingo number for a data sheet and a dealer list

READER SERVICE NO. 51



MADE
U.S.A.

Try a 6000 Series Remote Control from Monroe Electronics. For over 15 years Monroe has supplied the broadcast industry with DTMF remote control systems. Monroe's affordable 6000 Series Remote Control Systems provide reliable control and monitoring of remote sites via DTMF commands over telephone, microwave, two-way radio or other audio paths. Monroe Electronics has a remote control system to meet your needs.

For more information, call us today at (800) 821-6001

Distributor and Representative inquiries invited.

ME MONROE ELECTRONICS
LYNDONVILLE, NY 14098

800 821 6001
716 765 2254
FAX 716 765 9330

READER SERVICE NO. 142

ANALOG METERING WENT OUT WITH SLIDE RULE HOLSTERS.



TEL 171 for the Moseley TRC 15A \$880

If you've decided to go digital this year, why not do it now? You'll not only save money, you'll prevent all the hassles brought on by misreading your existing analog remote controls.

Hallikainen and Friends' TEL Digital Telmetry with programmable decimal points will provide you with the add-on accuracy you're looking for. It's simple to install, monitor and calibrate. And, it's available now.

Hallikainen & Friends

141 SUBURBAN ROAD SAN LUIS OBISPO
CALIFORNIA 93401 805/541-0200

READER SERVICE NO. 72

The MicMan™ Jr. - A 2 Channel Preamp



The MicMan™ Jr. Portable Mic Preamp

- 1 dB noise figure
- Gain range +26 to +82 dB
- 0.001% THD @ 1 kHz. @ A=40 dB

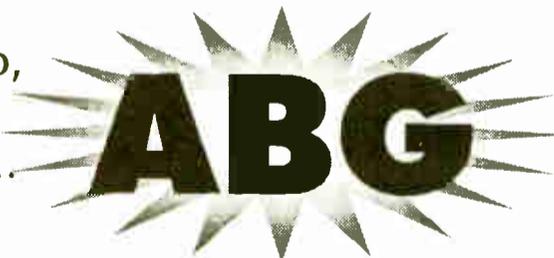
- 160 kHz bandwidth for transparent sound
- Fixed. (external PS-1), or portable use
- Uses standard alkaline batteries
- +12 or +48 V phantom microphone power
- Great value-\$425 with external power supply!

Benchmark
...the measure of excellence!

BENCHMARK MEDIA SYSTEMS, INC.
Phone 800-262-4675, FAX 315-437-8119

READER SERVICE NO. 194

Digital Audio, Analog Audio,
Communications and
Computers ... It's Easy as ...



Please visit us
on the
World Wide Web:
www.abg.com

Since 1960, production and broadcast professionals have turned to ABG for solutions. As the world has changed, so have our products, and so have we. From cutting edge digital production gear to the latest designs in custom studio furniture to ISDN telecommunications gear, ABG stays ahead of the game so you can concentrate on what you do best.

You create the messages...you move the world...we'll give you the tools to make it possible.

SOUTHEASTERN SALES OFFICE
200 Fareway Drive, Suite 2
Smithfield, North Carolina 27577
Phone: 800-369-7623
Fax: 919-934-8120

MAIN SALES OFFICE
2342 S. Division Avenue
Grand Rapids, Michigan 49507
Phone: 800-999-9281
Fax: 616-452-1652

WESTERN SALES OFFICE
P.O. Box 1638
Palmdale, California 93550
Phone: 800-858-9008
Fax: 805-273-3321

YOU MAY ALSO REACH US ANYTIME VIA ELECTRONIC MAIL
cServe: 75371,144
internet: support@abg.com



For 36 years
ABG
Audio Broadcast Group Inc.

READER SERVICE NO. 75

Attention
Advertisers:

Radio World

Combine Direct
Mail With Advertising
in a Total Marketing Package!

.....
RADIO WORLD reaches 18,000+
equipment buying prospects. The list
can be customized for your specific
needs. Select by geographic region,
firm type, occupational breakdown
or other sub-divisions.

Call **Christopher Rucas** at
800-336-3045
for more information!

WORKBENCH

Digital Delay Tames Squelch Tails

by John Bisset

SPRINGFIELD, Va. Bob Schmid is president of S-COM Industries in Loveland, Colo. He recently faxed a data sheet for a little device his company makes.

It is a digital audio delay module that is only 2.1 by 2.7 inches square, runs on 9 to 15 VDC, and delays up to 197 milliseconds.

The modules are used to kill "squelch tails." In the two-way business, these are the noise bursts you hear when a receiver goes from unsquelched to squelched condition. The devices are also useful for killing DTMF signalling tones.

The board has a built-in audio gate which is controlled by an outside signal. The signal can be switch-selectable to either high- or low-active. The amount of delay is controlled by a dipswitch and ranges from 12 to 197 milliseconds.

The response is only 30 Hz to 5 kHz, but this is sufficient for voice. Remember, it was designed for the two-way industry.

The module costs less than \$100 and a data sheet is available. For more information, you can contact S-COM at 970-663-6000 or circle **Reader Service 81**.

By the way, Bob shared a mic with RW's John "Q" Shepler on the Milwaukee School of Engineering's campus carrier-current station back in the early seventies. Ah, those humble beginnings.

★ ★ ★

Looking for your own "AM improvement" by upgrading your processing? I tested a pre-production version of a new, low-cost box for a client who did not have the money for one of the industry "cadillacs."

For much less than \$2,000, the DMS Sound box was an improvement over this client's Early American four-band. If you would like a data sheet, circle **Reader Service 135**.

★ ★ ★

Responding to a *Workbench* column on tower painting (these folks love Sherwin-Williams), I received an informative newsletter from Applied Engineering and Construction.

This is a division of Broadcast Communications in Wisconsin and in addition to tower work, the company can acquire and manage sites and provide project management.

The newsletter had a column on winterizing towers and we have permission to share some tips with our readers.

The first way to winterize towers is to inspect the tower anchors before the ground freezes. Digging 18 inches down at each anchor to check for corrosion is an important part of any complete inspection. Early detection of anchor failure is extremely important for the integrity of the tower and communications system.

With the high winds and icing conditions winter brings, guy wire tensioning is very important. Loose guy wires create a "galloping" motion that is dangerous to a loaded tower. According to manufacturers, galloping guy wires can bring down

towers 40 percent of the time during an episode.

Ice clips, also known as end sleeves, are normally installed on the end of each guy wire preform at the anchor. This safety device helps prevent the release of the preform and guy wire as ice slides down the guy wire.

Ice breakers are cone-shaped galvanized iron castings which protect the preforms and hardware securing the guy wire to the anchor head. They are bolted onto the guy wire two to three feet above the preforms with the point of the cone facing the tower. As a tube of ice slides down the guy wire, it shatters as it hits the ice breaker. Unless specified on your tower, they can be added later as an option.

Junction boxes for tower lighting and wiring will expand and contract during winter temperature extremes. The AC wiring or conduit can detach from the junction box, disconnecting the tower lighting. To help eliminate winter wiring damage, the junction boxes should be permanently attached to the tower with brackets and sealed from possible moisture.

If mid-level lighting is required on a tower, ice shields are an important addition. Ice falling from the upper half of the tower can smash the beacon glass and destroy a fixture worth \$1,000 to \$1,500. Obviously, a galvanized ice shield is a good investment.

Ice shields can also be installed to protect side lights and antennas.

Abandoned antennas and lines add unnecessary wind loading to a tower. During freezing rain conditions, all surface areas become heavily laden with ice. Even new towers only a few weeks old have collapsed from overloading caused by ice storms. If you have antennas or lines that no longer serve a purpose on your towers, have them removed before winter sets in.

We appreciate Broadcast Communications sharing these tips with our readers. If you would like more information on their tower services, call 608-527-5670 and ask for Jean Muehlfelt.

★ ★ ★

Power supply problems seem to stretch from the United States to the Northern Mariana Islands. That is where Bob Springer, chief engineer for Far East Broadcasting, found one such problem with his SMC 252 carousels.

Bob's tip is noteworthy because not everyone has gone to a hard disk system (yet), and his repair tip is applicable to all cart machines in general.

The mystery appeared to begin in the 150 Hz trip tone circuit because the automation would advance intermittently. His first thought was the presence of false 150 Hz cue tones on carts. Everything there was clean.

Given the machines were over 20 years old, Bob next checked the power supply for ripple or noise. Again, everything came out fine. He finally tracked the problem to transients on the AC line.

Using an old variac, he rapidly varied the voltage from 95 to 120 volts. As the

DC voltage varied, the 150 Hz cue detector relay tripped with every dip of DC voltage. The diagnosis: insufficient filtering.

Turning back to the power supply, he found the original 1100 mfd capacitors had been replaced with 1000 mfd caps. Even though the caps were okay, Bob paralleled a 220 mfd cap across the input section. Modifications were made to the other two carousels in service, and the

problem was alleviated.

If you wish to contact Bob Springer, febespneng@mcimail.com is his e-mail address.

□ □ □

John Bisset is a principal with Multiphase, a contract engineering and special projects company based in Washington, DC. He can be reached at 703-323-7180. The Workbench Column can be reached on-line at wrwbench@aol.com or submissions for the Workbench column can be faxed to 703-764-0751. Printed submissions qualify for SBE certification credit.

Quantum FM

Solid
State

Solid
Reliability

from

QEI

- Proven reliability
- Maintenance-free FET technology
- Self-contained modules with own power supply regulator
- Compact size reduces shipping costs, allows affordable air shipment
- Power levels between 300 Watts and 6 kW
- Modular design offers buy-only-what-you-need affordability and convenience

For the same price you pay for a tube transmitter, you can now have a superior solid state FM transmitter with high-power, advanced technology exciter and cableless combiner. The modular design of QEI's QUANTUM-Series FM transmitters offers the advantage of buying only the amount of power you need...and means that you can upgrade to higher power levels whenever you're ready.

QUANTUM from QEI-the people who have been designing and building solid state transmitters longer than anyone else in the industry.

You need to know more! Call Jeff Detweiler today toll free (800) 334-9154.

QEI Corporation
One Airport Drive • P.O. Box 805
Williamstown, NJ 08094

Tel (800) 334-9154
Fax (609) 629-1751

24-Hour Service Hotline
(609) 728-2020

STATION SKETCHES

Peak Performance from Analog Recorders

by Tom Vernon

HARRISBURG, Pa. In the Sept. 20 RW, I talked about aligning analog tape recorders. The point was made that the mechanical alignment must be verified before proceeding to playback and recording adjustments.

First, a few words about alignment tapes. You should purchase tapes that match your reference fluxivity level — normally 180 or 250 nWb/M (nanoWebers per Meter) — and with the proper equalization standard, normally NAB.

Alignment tapes wear out over time, resulting in reduced HF levels. Plan on replacing them every year or two. Almost all alignment tapes are full track, and cannot be used to verify low frequency response below 500 Hz at 15 inches per second (ips) due to an anomaly known as the fringing effect.

Avoid fast forward, stop, and rewind functions when using an alignment tape. They will stretch the tape and reduce its lifespan considerably.

Tones on tape

Having completed head alignment last time, the first step in playback alignment is setting the reference level and high-frequency (HF) equalization. Use the 1 kHz reference tone to set the output level to +4 dB, and the VU meter calibration pots to 0 VU.

Next, set the HF EQ pots for 0 VU at 10 kHz. If you had to adjust the HF pot, go back and verify reference level, as there may be some interaction if EQ was way off. Play the frequency response section again and log response for both channels between 500 Hz and 20 kHz. It should fall well within the manufacturer's specifications.

If you are maintaining several machines

in one plant, consistency between machines is critical. For this reason, use the same physical piece of tape for all azimuth adjustments.

Having satisfied yourself that your machine's playback electronics are up to snuff, you may finish off adjustments with the record section. Adjustments usually begin with the bias circuits.

Although often overlooked, the first thing to check is bias frequency. Although absolute bias frequency is not critical to audio performance, an off-frequency bias oscillator can cause problems. Bias traps and erase peaking resonance circuits will not work properly if the oscillator is misbehaving.

Next, follow any manufacturer's instructions for adjusting bias traps and peaking circuits. Always check bias traps after replacing heads.

Critical settings

Setting bias levels is the next step, and a critical one. Improper bias will result in high harmonic distortion and noise, degraded midrange headroom, and poor high-frequency response.

There are several methods for adjusting a machine's bias levels. Older manuals often recommend recording a

1 kHz tone at reference level, and adjusting bias for a peak while monitoring playback. Because this peak is very broad, it is unlikely you will end up at the point of minimal noise and harmonic distortion. If a machine is badly out of adjustment, this procedure will get you in the ballpark quickly, but is not recommended for final tweaking.

The most common method is over-biasing. To do this, you will need to start with the proper oscillator frequency and level for the speed you are working with. For 15 ips, use 10 kHz, for 7.5 ips use 5 kHz, and use 20 kHz for 30 ips. In all cases, adjust for standard reference level. Begin with the bias pots turned completely down, and gradually increase them while observing playback output.

Adjust for peak output and continue increasing for a 1.5 to 3 dB decrease, as per manufacturer's instructions.

The most precise method of adjusting bias is for minimum distortion. Do this by recording a 1 kHz tone at reference level and adjust bias for minimum harmonic distortion. This method only works if wow and flutter are within specs.

Continue alignment with HF record equalization. Adjust for a flat response at 10 kHz. On some machines, with certain tape, you may have to retweak the bias slightly for optimal HF response.

Provisions for lows

Many recorders also have provisions for adjusting low-frequency (LF) playback response. To do this properly, you use the recording section, because the fringing effect makes LF playback adjustment impossible below 500 Hz. While recording, sweep the oscillator between 100 and 250 Hz. You should see a peak somewhere in this vicinity. You may now set the low frequency equalizer for optimum overall flatness.

Make another sweep and confirm 1 kHz and 10 kHz are still okay, as there may be some interaction. Finally, check overall frequency response and be sure it is within specs.

While many machines have a set of "tweakers" for high and low speed adjustments, others may not. If this is the case, you must optimize the machine for the speed you use the most, or settle for a compromise. This is especially true if there is only one adjustment for record level.

The quality of service manuals for reel-to-reel equipment varies considerably. In some cases I have had to rewrite manuals where the originals left out critical information or were misleading. Do not hesitate to call the manufacturer and pester the customer service department if things are not clear; that is why they are there.

With care, patience and a regular maintenance routine, you should be able to narrow the gap between CD and analog sound quality.

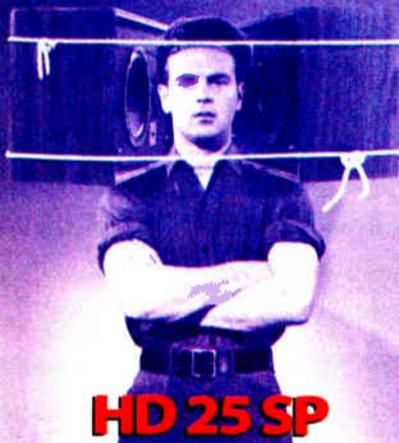
□□□

Tom Vernon divides his time between consulting and completion of a Ph.D. at the University of Pennsylvania in Philadelphia. E-mail him at TLVernon@aol.com or call 717-367-5595.

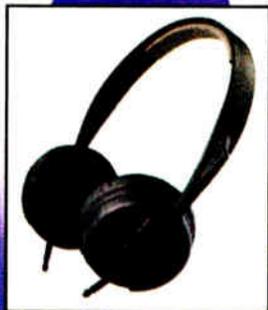
Think of Them as Reference Monitors You Can Wear

When you need to hear exactly what you've recorded... nothing more, nothing less... then only Sennheiser's HD 25 SP will do. Excellent isolation, with clear, accurate reproduction are the trademarks of these reference-quality headphones. Plus, they're MUCH more comfortable than wearing speakers.

Your project studio is incomplete without the HD 25 SP. Check them out today at your local Sennheiser dealer.



HD 25 SP



SENNHEISER

6 VISTA DRIVE, P.O. BOX 987, OLD LYME, CT 06371
TEL: 203.434.9190 • FAX: 203.434.1759

IN CALIFORNIA: 4116 WEST MAGNOLIA BLVD., SUITE 100,
BURBANK, CA 91505 • TEL: 818.845.7866 • FAX: 818.845.7140
IN CANADA: 221 LABROSSE AVE., PTE.-CLAIRE, PQ H9R 1A3
TEL: 514.426.3013 FAX: 514.426.3953

Circle (92) On Reader Service Card

SATELLITE SYSTEMS

Ariel Digital Satellite RECEIVER

- 5 card slots for up to 10 audio channels
- next day shipment of replacement boards
- fully compatible with Fairchild Dart 384
- 1-24 transponder capability
- 24-hour technical support
- extra heavy-duty power supply
- 1-year warranty (with exception of shipping charges)

SATELLITE SYSTEMS



Satellite Equipment for Radio

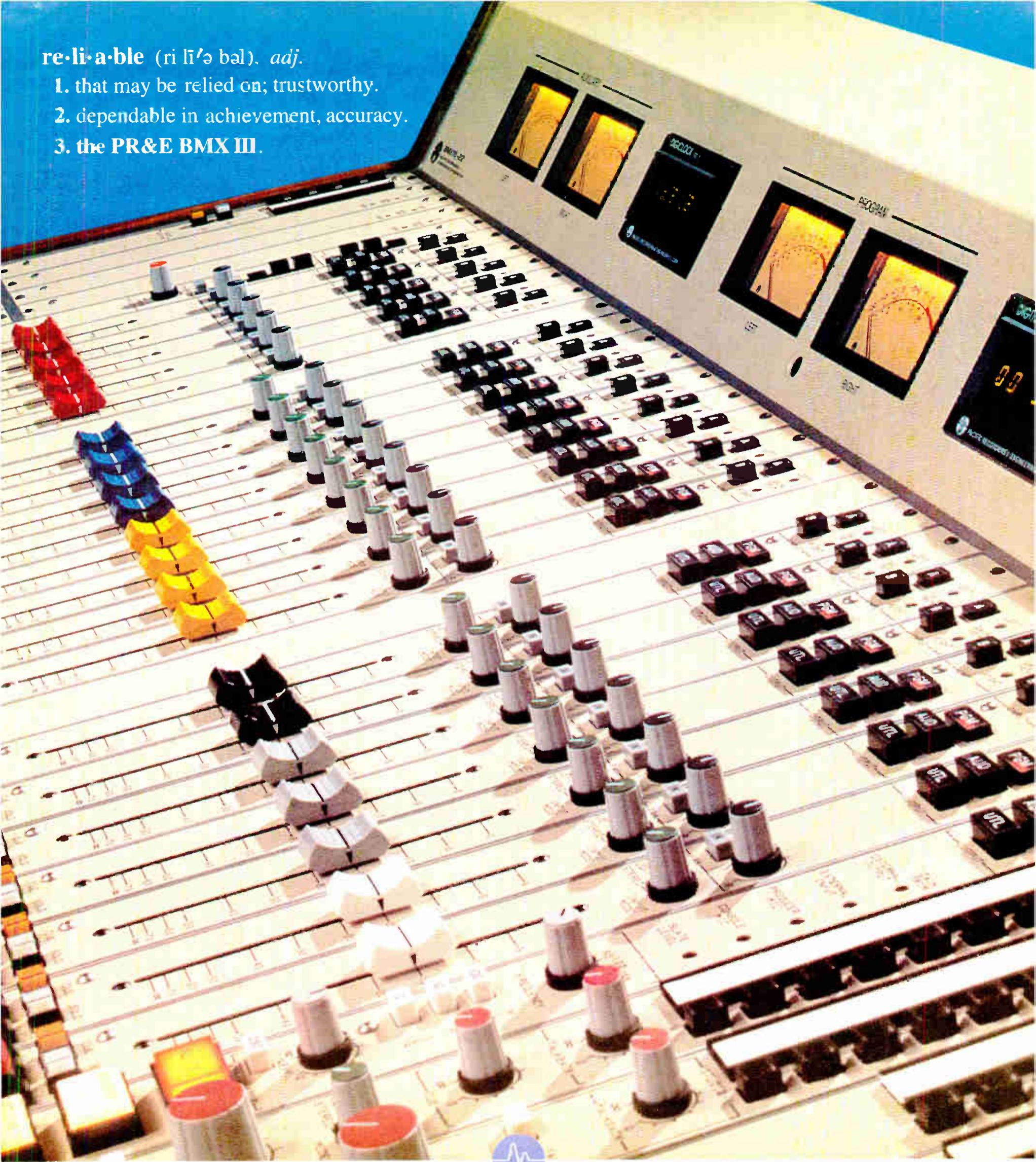
615 East Brookside
Colorado Springs, CO
80906

Ph: (719) 634-6319
Fx: (719) 635-8151

Circle (46) On Reader Service Card

re·li·a·ble (ri lī'ə bəl). *adj.*

1. that may be relied on; trustworthy.
2. dependable in achievement, accuracy.
3. the PR&E BMX III.



PACIFIC RECORDERS & ENGINEERING
DESIGNS THAT MAKE THE DIFFERENCE

2070 Las Palmas Drive, Carlsbad, CA USA 92009

GSA Contract: GS-03F-4064B

Tel: 619-438-3911

Fax: 619-438-9277

E-Mail: sales@pre.com

Circle (161) On Reader Service Card

World Radio History

Two portables & two pairs of cans



The new SADiE Portable.
The first portable digital
audio workstation.

SADiE customized
Pentium Portable PC
Digital, analogue and
time-code cards
SADiE software V.2.2
Four Gigabyte
removable SCSI drive
Headphone amp
Switchable power supply
Lightweight flight-case



Price \$13,995.00



Studio Audio Digital Equipment Inc.
1808 West End Avenue
Suite 1119
Nashville
TN 37203
Tel: 615 327 1140
Fax: 615 327 1699
Circle (114) On Reader Service Card

World Radio History

Microcontrollers for the Station

by Jim Somich

CLEVELAND Microcontrollers have become a part of our everyday lives, from the control systems of VCRs to programmable thermostats and coffee pots. The microcontroller is a stripped-down computer designed to do a specific task or a range of specific tasks.

With the introduction of simple, application-specific microcontrollers to the experimenter market, it is now possible to use them to monitor and control functions around our broadcast plant. Rather than build complex relay-logic circuits to perform simple operations, we can now control complex functions with a relatively simple piece of hardware programmed with application-specific software that we write.

The cost of microcontrollers has been reduced and they are often less expensive to use than other forms of control or logic. Applications around the broadcast plant include transmitter monitoring and control, used as simple automation switchers and machine control systems as well as hundreds of other uses.

Introduction

There are hundreds of microcontrollers on the market, from very simple devices like the Parallax Basic Stamp to elaborate processors with as much memory as a PC.

This month we will take a close look at the Blue Earth Micro-440e controller. It is a good middle-ground between very simple and very complex devices. The 440e is readily available, low-cost and simple to program in BASIC or assembly language. The manufacturer, Blue Earth Research of Mankato, Minn., provides excellent support through complete users' manuals, data books and a BBS.

Experimenting with the Micro-440e is a good introduction to the world of microcontrollers. A basic microcontroller like the 440e has many uses: To monitor and control electronic devices; To assist in writing and debugging assembly language programs; As the brains of an electronic project; To link your PC with real world sensors and peripherals; As a prototyping platform for product designs; To control appliances, lighting, and heating & air conditioning equipment; As a remote data collection device; As a programmable tester in the station environment; To control electronic experiments.

What is it?

The primary difference between a microcontroller and a microprocessor is that the microcontroller provides for considerably more on-board processing ability than a simple microprocessor. The 80C32-compatible microcontroller used in the Blue Earth 440e is based on the 8051 controller. The 8051 features: An eight-bit CPU optimized for control applications; Extensive Boolean processing (single-bit logic) capabilities; 64K Program Memory address space; 64K data Memory address space; 4K bytes of on-chip program memory; 128K bytes of on-chip data RAM; 32 bi-directional and individually addressable I/O lines; Two 16-bit timer/counters; Full duplex UART (Universal Asynchronous Receiver-Transmitter); 6-source/5-vector interrupt structure with two priority levels; On-chip clock oscillator

A block diagram of the 8051 core is shown in Figure 1.

When the processing power of a microcontroller like that of the 8051 family is combined with application-specific peripherals in a single package, the combination results in a compact, low-cost microcontroller system with enormous power for its size and price. The Blue Earth Micro 440e is an excellent example of this power.

A look inside

Figure 2 is a block diagram of the Blue Earth Micro 440e microcontroller. The major components included in the figure are:

- 1) An 80C32-compatible microcontroller
- 2) A 32K-byte CMOS EPROM with BASIC and MONITOR-51
- 3) A 32K-byte CMOS static RAM with

write protect feature

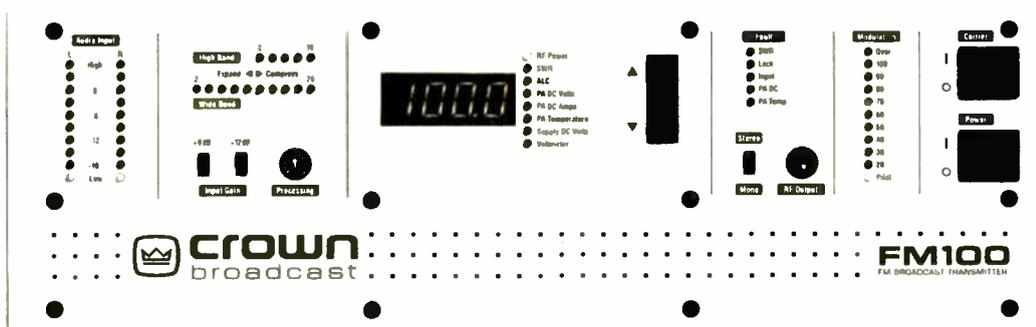
- 4) A Real Time Clock/Calendar with interrupt generating capability
- 5) An 8-channel, 8-bit Analog to Digital Converter
- 6) A precision low-power five-volt regulator
- 7) A 3.6-volt lithium backup battery with 10 year minimum lifetime
- 8) Two 25-pin D-Sub connectors providing access to CPU ports and bus signals
- 9) An RS232-C driver/receiver providing two communications channels

The 440e uses an 80C32-compatible CMOS microcontroller running at 12 MHz (1µs instruction cycle time).

continued on page 54 ►



Translator! The FM Transmitter of Choice



Integrated Transmitter Systems by CROWN®

Applications

- ┌ Suited for FM translator service
- ┌ Ideal for satellite or terrestrial-fed systems
- ┌ Use it as a stand-alone transmitter
- ┌ Use it as a stand-alone exciter with composite input
- ┌ Use it as an FM exciter with built-in IPA
- ┌ Great for community and campus radio
- ┌ A perfect backup transmitter system

Models

- ┌ FM30, adjustable from 3 to 33 watts output
- ┌ FM100, adjustable from 20 to 110 watts output
- ┌ FM250, adjustable from 20 to 250 watts output
- ┌ FM500, 50 to 500 watts (available third quarter '95)

Integrated System Components

- ┌ FM exciter (digitally tunable, frequency-agile)
- ┌ Audio processor (with compressor/limiter)
- ┌ Stereo Generator
- ┌ RF Amplifier
- ┌ Lowpass Filter
- ┌ New, optional FM Receiver Module
- ┌ New, optional FSK IDer

Features

- ┌ Excellent signal quality and reliable performance
- ┌ Lightweight, compact, easily shipped worldwide
- ┌ 110/120 VAC, 220/240 VAC or DC powered
- ┌ Built-in digital metering and diagnostics
- ┌ User tunable from 88 to 108 MHz
- ┌ Optional tuning for 65-73 MHz in 10 kHz steps
- ┌ Modular, flexible design
- ┌ Fully illustrated and detailed user information
- ┌ Type notified for FCC part 73 & 74; meets FCC, DOC, and CCIR requirements
- ┌ Quick setup; designed for easy installation even by non-technical people

For more information, contact Crown Broadcast Sales at (219) 294-8050 or fax (219) 294-8302.

CROWN
broadcast

A Division of Crown International, Inc.
1718 West Mishawaka Road
Elkhart, Indiana 46515-1000
Phone: (219) 294-8050; FAX: (219) 294-8302

PIONEER PROFILE

'Doc' Herrold and His Arc-Fone

by Barry Mishkind

TUCSON, Ariz. Long before anyone thought about the question of who was the first broadcaster, a list of young men around the world were experimenting with the new wireless transmitter technology that Marconi had brought forth. Fessenden, de Forest, Tesla, Hertz, Edison, Conrad, Herrold, Stubblefield, and many more were out there.

When the Department of Commerce began issuing licenses in 1911, a number of amateurs applied for licenses to cover experimental stations they had

constructed over the previous five or six years. By the way, that legendary "first" license was issued to George Lewis of Cincinnati.

In the main, Marconi, Fessenden, Hertz, Edison and even de Forest came to be better known as scientists and inventors rather than broadcasters. KDKA truly has its place in history as the earliest commercial licensee, even though "commercials" as we know them were years off.

Even so, several stations can trace their history to before November 1920 and KDKA's predecessor, 8XK.

With all this to consider, attempting to define the "father" of broadcasting may not be a reasonable assignment. For example, what about Charles D. Herrold?

Charles who?

A decade before Frank Conrad built the station that would become KDKA (as part of a bet on the accuracy of his watch), Charles Herrold was experimenting in San Francisco. The initiation of voice transmissions from his "Herrold College of Wireless and Engineering" at San Jose, Calif., in 1909 made Charles "Doc" Herrold a true pioneer.

Herrold was born November 16, 1875 in Illinois. His father was a farmer and inventor, and it was natural that Charles would also be keenly interested in science and mechanics. Like his father, he was an inventor developing new products in dentistry, surgery, photography and music.

His early love of astronomy led to his invention of a clock-driven telescope. The loss of his school's only astronomy professor caused him to move into physics and electricity, where the wireless took over his life.

Eventually Herrold built a 15-watt spark gap transmitter, but he wanted more than just telegraphy. He wanted to transmit voice information.

In an effort to increase output power, a carbon microphone was connected in series with the B+ high voltage supply of the spark transmitter. As much as 50 watts of output power could be developed this way.

Early listeners began to hear "This is the Herrold Station" or "San Jose Calling." The call letters "FN" were adopted for a while, as were 6XE, 6XF and SJN.

Transmission time was curtailed by the need to replace the carbon element every one or two hours.

Refinements

Improvements were made that led to the invention of the "Arc Fone."

The Arc Fone was essentially six arc lights connected in series, developing a high-frequency arc carrier which could be modulated by voice. At first, the necessary 500 volts was tapped from the street-car lines. A special water-cooled microphone had to be built to prevent it from burning out. The Arc Fone was patented on Dec. 21, 1915.

In the meantime, Herrold had decided one of the best uses for his invention was to feed the interest of experimenters with regular programs that would publicize his college.

He set up a listening room with chairs and 24 receivers at a local furniture store. Later, he would set up a second transmitter at the Fairmont Hotel in San Francisco. In effect, he became a pioneer of two-way broadcasting in 1912.

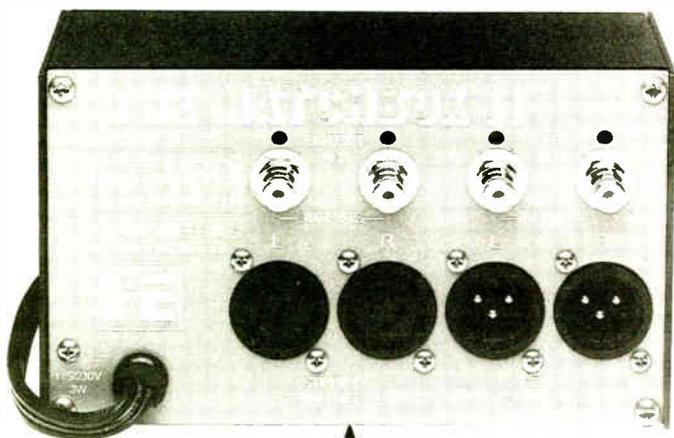
Unique programming

It may well be that the weekly "Little Ham Program," sent out every Wednesday evening at 9 p.m., qualifies as the start of broadcasting — at least by the definition Herrold himself used. As the son of a farmer, the concept of "broadcasting" seed was well known to Herrold. He claimed to have been the first to adapt the term to wireless transmission, particularly in relation to regularly-scheduled entertainment programs.

The DJ on Herrold's station was noteworthy. The first woman to broadcast was his wife, Sybil, who played records provided by the Sherman Clay music store. In doing this, the Herrolds quite likely developed the first commercial "trade-out."

Listeners from as far away as 900 miles called to request records during the program.

continued on page 54 ►



Balancing Box.

The Matchbox II is Henry Engineering's new version of the industry's most popular level and impedance converter.

Now it's even easier for you to use digital editors and computer sound cards with new user-programmable gain to properly match the low level outputs of these units. Matchbox II instantly brings your levels up to +4dbm, 600 ohm balanced lines.

All outputs are now adjustable, with four level controls for quick and accurate setup.

The dynamic range is increased to provide superb audio. And the best quality gold-plated RCA connectors are added for ultimate reliability.

All this and the price stayed the same. In stock and ready for immediate shipment from the broadcast pros at Harris Allied. Call us toll-free.

1-800-622-0022

Fax 317-966-0623

**HARRIS
ALLIED**

©1995 Harris Corp.

Circle (50) On Reader Service Card

Belar
STEREO MONITOR

You can measure...
with the best monitor and the most accurate test set.

The FMM-2/FMS-2 series monitors provide an even greater degree of precision measurement than ever before... **You can measure** S/N below 90 dB, **You can measure** crosstalk below 85 dB, **You can measure** separations of better than 70 dB, **You can measure** frequency response to better than 0.25 dB, **You can measure** distortions to lower than 0.01%, and much more... Our uncluttered panels and autoranging voltmeters make these measurements a dream.

BELAR (610) 687-5550
ELECTRONICS LABORATORY, INC.
LANCASTER AVENUE AT DORSET, DEVON, PENNSYLVANIA 19333
Call or write for more information on Belar AM, FM, Stereo, SCA and TV monitors.

Circle (77) On Reader Service Card

Products & Services Showcase

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

DON'T BUY A DIGITAL AUDIO SYSTEM UNTIL YOU TALK TO US!

The Digital Juke Box
Digital Broadcast Automation

More Features
+ Less Money
= A much better deal



Listen-Up Software
One Eleven Sandy Ave
Moundsville, WV 26041

(304) 845-4767 Phone
(304) 845-0038 Fax

READER SERVICE NO. 70



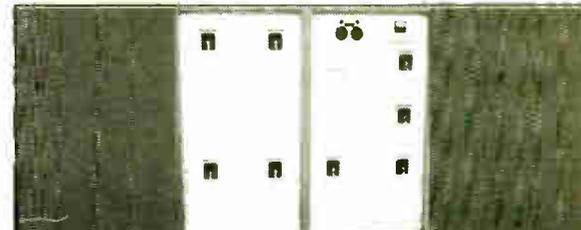
Pristine
SYSTEMS INCORPORATED
DIGITAL ON-AIR SOLUTIONS

- Feature Rich Live Assist and Walk Away
- On-Line Redundancy...No Black Box
- The Best Integrated Play List Scheduler (Music & Breaks) & On-Air Playback
- Dolby AC2 Overlapping Hard Disk Audio
- Music on Hard Disk and/or CD Jukeboxes
- Provide Computers/Players & Save \$\$\$ or Buy/Lease From Us

WEST/INT'L
310/670-7500
FAX 310/670-0133

EAST
803/370-2400
FAX 803/370-2314

READER SERVICE NO. 172



- CUSTOM ANTENNA PHASING SYSTEMS
- ANTENNA CONTROL SYSTEMS
- AM/MF ANTENNA TUNING UNITS
- DIPLEXERS & MULTIPLEXERS
- TRANSMITTER COMBINERS
- DUMMYLOADS (WITH MATCHING NETWORK)
- ASSOCIATED RF COMPONENTS
- CALL OR FAX FOR MORE INFORMATION

PHASETEK INC.

550 CALIFORNIA RD. UNIT 11
QUAKERTOWN, PA 18951

PHONE: 215-536-6648
FAX: 215-536-7180

READER SERVICE NO. 124

54,123

ELECTRONIC COMPONENTS

Whether you order 1 part or all 54,123...MOUSER stocks and...ships same day!!

CALL (800) 992-9943

for your FREE CATALOG

MOUSER ELECTRONICS

958 N. Main St., Mansfield, TX 76063
Sales & Stocking Locations Nationwide

READER SERVICE NO. 190

REMEMBER THE *CORTANA* FOLDED *UNIPOLE* ANTENNA? WE STILL MAKE IT WITH THE SAME HIGH QUALITY MATERIALS AND WORKMANSHIP. IT FEATURES...

- BROAD BANDWIDTH
- GROUNDED ANTENNA
- EUMINATES ISOCOUPERS
- BEST ANTENNA FOR DIRECTIONAL ARRAYS.

ALSO

nott ltd.

READER SERVICE NO. 166

Quality* Power Tubes

3CX15000H3	4CX1600B	4CX250BT
3CX15,000A7	4CX1500A	4CX250EM
3CX15,000A3	4CX800A	4CX250BC.8957
3CX15,000H3	4CX400A	4CX250B/7203
3CX10,000H3	4CX350AC	4X150A.7034
3CX10,000A7	4X350A/8321	5CX1500B
3CX3000F7/8162	4CX250R/7580W	5CX1500A
3CX3000A7		YC130.9019
3CX2500H3		8560AS
3CX2500F3/8251		811A
3CX2500A3/8161		833A
4CX15,000A/8281		833C
4CX15000J		SK300A
4CX10,000D/8171		SK1300
4CX5000A/8170		SF1320
4CX3500A		



- Watch this list grow.
- Manufactured in Russia's largest power tube factory.
- Shipments from USA stock.
- Generous* warranty based on high quality.
- Honest prices based on quality at low cost.

Broadcasters

Phone: 205-882-1344
FAX: 205-880-8077
800-239-6900

OEMs. Distributors

Phone US: 800-578-3852
Int'l & US: 415-233-0429
FAX: 415-233-0439

READER SERVICE NO. 141

EBS EQUIPMENT



Model CFB Encoder-Decoder	\$540
Model CE Encoder	\$375
Model CE with Stereo Option	\$405
Model CD Decoder Only	
(REQUIRED FOR LPTV)	\$320
Receiver can be supplied to drive Decoder	\$100

- Encoder FCC Type Accepted
- Decoder FCC Certified
- Exceeds FCC Specifications

All interconnections to the EBS equipment are made through a barrier terminal block. No special connectors necessary. In stock—available for immediate delivery.

GORMAN REDLICH MFG. CO.
257 W. Union St.
Athens, Ohio 45701

Phone 614-593-3150 • FAX 614-592-3898

READER SERVICE NO. 215

HURRY UP

TELESCOPING MAST for fast and easy deployment of lightweight antennas

- Manually deployed with quick lock/release collars in one minute or less
- 25' extended height
- 6' retracted height
- 20 lb. top load capacity
- Rigid azimuth locking
- Over 50 mph wind speed capacity
- Free standing
- Universal vehicle mounting stand included
- Portable: 20 lbs.
- High strength anodized aluminum construction
- Ideal for lightweight antennas
- Designed and built by the leading manufacturer of pneumatic telescoping masts.

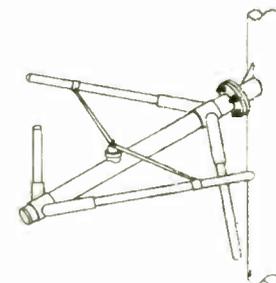
W3
WILL BURT

P.O. Box 900
Orville, Ohio 44667-0900
Phone 216-682-7015
FAX 216-684-1190

READER SERVICE NO. 45

SWR FM Antennas

Leading the Way in High Performance Antennas



Contact **Jimmie Joynt**



Factory Direct Sales
Ph 800/279-3326
Fax 800/644-5958

17194 Preston RD #123-297 Dallas, TX 75248

READER SERVICE NO. 195

Inside the 440e Microcontroller

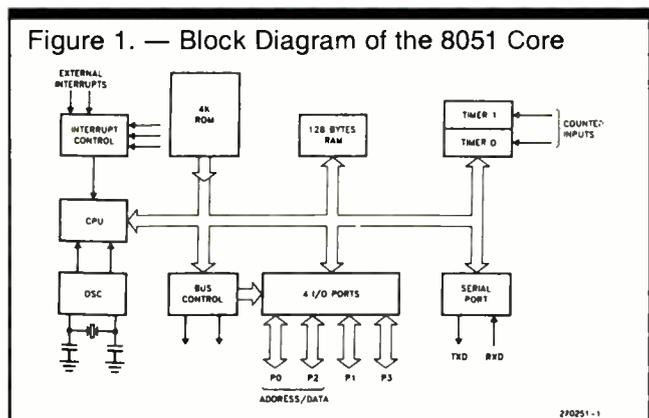
► continued from page 51

The CPUs used include the 80C154 and the 8xC51FX series, with the 80C51FA being standard. Both are enhanced versions of the Intel MCS-51 family, a world standard eight-bit architecture.

The 8xC51FX has features that make it a powerful microcontroller for a wide range of control applications. It is ideal for applications that require pulse width

accidental erasure or overwrites. The user may add additional memory by interfacing to the expansion port connector.

The real time clock/calendar (RTC) module allows the controller to keep track of the current day, date and time. It has counters to track from seconds up to years. The RTC also features a 12/24 hour format, automatic leap year setting, a 30-second error adjustment function and an interrupt output which has a selectable period of 1/64th second, one second, one minute or one hour.



modulation, high speed I/O and up-down counting capabilities. It also has a versatile serial channel that simplifies multi-processor communications.

Memory Configuration

The controller includes 32KB of low power CMOS EPROM that can be read as program (code) memory. In standard configuration, the Micro will only access 16KB as code memory. This 16KB contains an 8KB floating-point BASIC interpreter and an 8KB debug monitor.

The BASIC interpreter allows the user to program the controller using standard BASIC commands and statements. The debug monitor provides development tool features which can be used to assist in assembly language program development. The remaining 16KB can be accessed by changing the EPROM access jumper.

The controller includes 32KB of low power CMOS static RAM usable for program and/or data storage. Blocks of memory may be write-protected to prevent

ended, differential or pseudo-differential operating modes. It can be used to measure the output of various transducers that generate signals in the range of 0 to 5 VDC. One of the input channels is dedicated to measuring the controller's input supply voltage.

The Micro provides two independent RS232C-compatible asynchronous communication channels. The primary channel is typically used for communicating with a host computer or terminal at up to 19.2 kilobits per second (kbps). The second channel can be used for hardware handshaking, as an alternate communications channel, or as a line printer port (with BUSY input) to support BASIC List# and Print# statements.

Any DC power source capable of 7-16 volts at 75ma can be used to power the unit. An on-board regulator provides a stable +5 volts for proper operation. The power supply also includes reverse input polarity protection, CPU reset circuitry and battery backup.

A 3.6-volt lithium thionyl chloride battery with a rated 0.85 ampere-hour

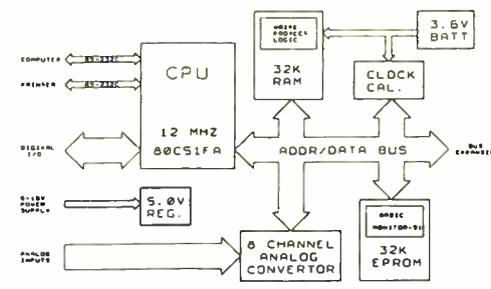
capacity provides backup power to the RTC and memory. Continuous clock operation and data integrity will be maintained for a period of at least ten years with no external power applied.

The I/O port connector on the controller allows the user to interface to 14 of the CPU's port 1 and port 3 I/O lines. Both assembly language and BASIC can directly access these lines.

External circuits may be easily interfaced to the controller through the expansion port. All of the bus signals necessary for adding additional external memory or I/O devices are provided.

All of this processing power is bundled in a compact package that fits in the palm of your hand and costs less than \$200.

Figure 2. — Block Diagram of Blue Earth Micro 440e Microcontroller



For more information on the Micro 440e, contact Blue Earth Research at 507-387-4001. Jim Somich is a radio broadcast engineering consultant and president of MicroCon Systems Ltd., a manufacturer of broadcast equipment. He can be reached at 216-546-0967.

Was Charles Herrold Father of Broadcast?

► continued from page 52

Among the techniques used by Herrold to cultivate audience interest was the awarding of weekly prizes to regular listeners.

Aside from ads for his college and the trade-outs for records, Herrold had no commercials as we know them. He apparently had some ideas on the subject and wrote the Department of Commerce to ask about using the station for paid advertising.

The reported response was, "Under the laws we can find nothing by which we can prevent your selling merchandise over the air, but by the Lord Harry we hope that somebody does."

The big test

By 1915, Herrold's station SJN was well-known throughout the region by amateur radio enthusiasts. It was during the World's Fair of that year that the new medium was given a real stress test.

Lee de Forest had set up a transmitter and receiver at the Fair, but the transmitter failed to operate. The upshot? Herrold's Arc Fone transmitted from San Jose — 50 miles away — to the fairgrounds, eight hours a day during the Fair.

The demonstration amazed fairgoers, who listened to music and news about the Fair. One of Herrold's associates reported that people who came into the booth would often start looking under the table or in the back. They just could not believe the voices and music were coming from 50 miles away!

Recognition elusive

With all this background, why is it that many books and historians ignore "Doc" Herrold and his achievements?

Perhaps it was just a matter of timing. In April 1917, all non-governmental broadcasting was ordered off the air for the duration of the war. During that time, all radio patents were "pooled" in order to provide the best radios for the military. Electronic advances tied to de Forest's Audion tubes as well as other advances

made the mechanical Arc Fone obsolete.

After the war, Herrold rebuilt his station to conform with the new technical standards, but had a hard time keeping his station going into the 1920s.

In 1921, the Department of Commerce assigned KQW as the station identification. His dream began to unravel as he was forced to sell KQW in 1925. Sadly, the "handshake" arrangement he had with the First Baptist Church broke down and he was soon fired as the station engineer.

The last change in calls was in 1949 and the station is known today as KCBS, San Francisco.

Over the years, Herrold tried various ways to stay near broadcasting. He was one of the first time-brokers, buying time from stations, and then re-selling it to others. An effort to establish himself as "the Father of Broadcasting" failed to attract much attention from the broadcast community. The last years of his life were largely marked by a string of menial jobs, including that of a security guard.

A saddened Charles Herrold died at age 73 on July 1, 1948.

Was Charles "Doc" Herrold the Father of Broadcasting? Possibly. What is certain is that he was a father of broadcasting.

If you or your station has a written history or any information on the roots of broadcasting, please share them with Barry Mishkind. Books, news clippings, old licenses, ratecards, EKKO stumps, radio guides, photocopies or anything that would illuminate the trailblazing stations and the pioneers who built them are of benefit. Send them to Barry Mishkind, 2033 S. Augusta Place, Tucson, Ariz., 85710. The information will be added to the OLDRADIO infobase, and eventually donated to an archive open to all.

Barry Mishkind can be reached at 520-296-3797, or barry@broadcast.net via the Internet. Find his home page at <http://www.broadcast.net/~barry/>

GRUNGE!

Now You Can Be Dominant and Sound Great at the Same Time

We have re-written the book on FM composite processing. Move up to the crystal-clear sound of the FM FlexiMod and control your market with a dominant, dynamic new sound.

The FM FlexiMod is the culmination of ten years of research into aggressive composite processing. Its new approach to loudness control without distortion, will revolutionize the sound of your station.

The FlexiMod will add sparkle and body to over processed, multi-generation audio, and enhance all program material for a consistent, dominant on-air sound.

The secret behind the breakthrough performance of the FM FlexiMod is our proprietary c-limiter circuit. This hybrid limiter-clipper will give you brick wall modulation control with extremely low second-harmonic distortion products.

Loudness without grunge!



The FM FlexiMod is the only processor you will need to guarantee your dynamic presence on the dial. It will clean up your sound and increase your loudness by 3db or more!

We guarantee it!

FlexiMod: Already over-achieving in major markets nationwide
Only \$1395.

Available direct from MicroCon Systems or from selected dealers.
30 day no risk on-air trial

For further information contact:

Jim Somich at MicroCon Systems Ltd. • (216) 546-0967

Step into the Future

If your on-air system is a little out of date, step into the future with Gentner and Harris Allied—your total audio conferencing solutions.

Gentner's TS612 simplifies the process of bringing callers together by putting the controls right at your fingertips. This means a smoother on-air sound with an audience less likely to switch.

The control surface is easy to use. It looks, operates and even feels like an ordinary business telephone.

But it's far from ordinary.

On-air talent can screen a call, transfer it from the handset to on-air, conference as many as four callers together, and lock in a VIP guest.

Thanks to multi-color line status indicators the user can instantly tell who's on the air, on hold, screened or talking to the producer in the other room.

Installation is a snap.

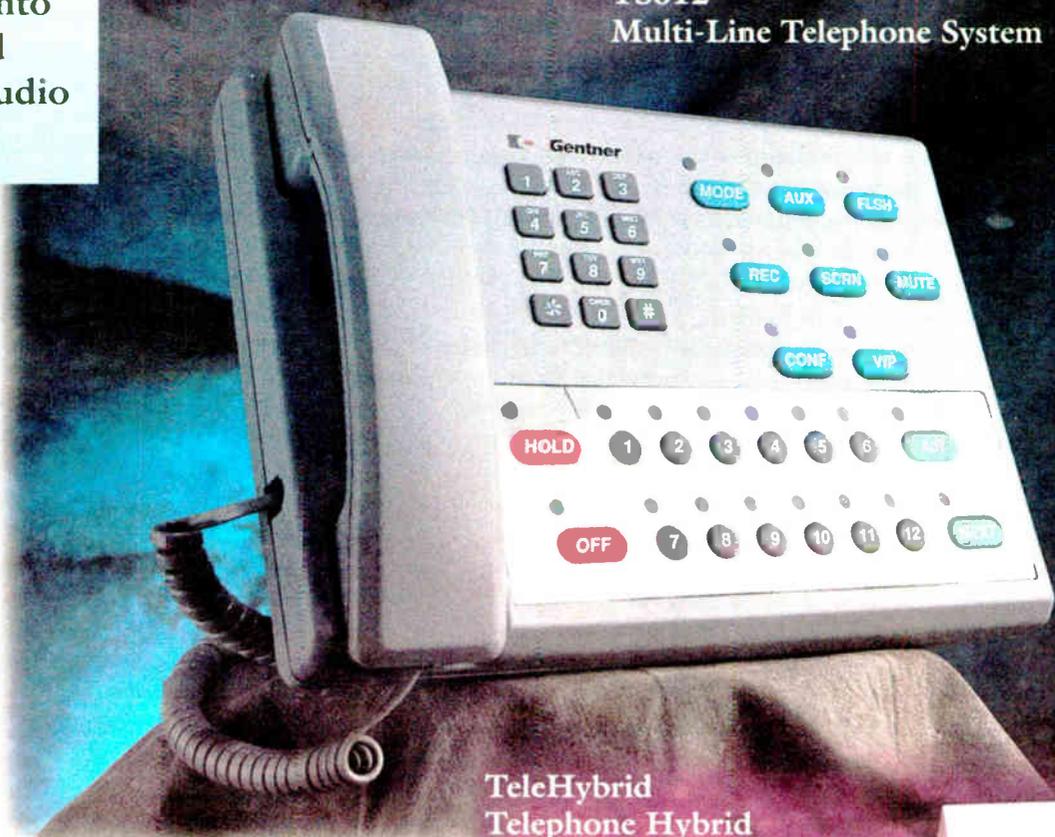
The TS612's dual superhybrid technology provides crisp, clean caller audio with much more flexibility.

With Gentner's SCREENWAIR software and a PC, a screener uses a keyboard and a headset instead of a control surface, and preselects calls for on-air, adding names, comments, city of origin and other information. An additional monitor is placed in the studio where the talent can see who is on screened hold.

NETWORK INTERFACE lets you expand the TS612 system into multiple studio configurations by adding a Network Interface for each mainframe. This provides the communications link between studios for proper management of 12 phone lines.

 **Gentner**

TS612
Multi-Line Telephone System



TeleHybrid
Telephone Hybrid

Telephone calls for broadcast teleconferencing and pro audio applications are made easier thanks to Gentner's TeleHybrid. Simply connect it to your existing telephone to deliver full duplex audio to your console or conference system without the fear of echo or feedback.

The TeleHybrid is the key to simple, great sounding telephone calls on your professional audio system.

Your telephone can be single or multi-line, analog or digital—the TeleHybrid doesn't care. The only requirement is that your telephone have a detachable handset with a modular connector.

The TeleHybrid "installs" between your telephone and its handset. Audio connections

to your equipment are made with XLRs.

With the TeleHybrid, the hassle and expense of dedicated phone lines are a thing of the past. Your regular telephone system becomes your "on-air" system. Anyone in your facility can screen a call or transfer it to the studio or boardroom. Best of all, the TeleHybrid is very affordable.

The future is with Harris Allied for your total audio conferencing solutions by Gentner..

1-800-622-C022 FAX 317-966-0623

 **HARRIS
ALLIED**

Circle (19) On Reader Service Card

World Radio History

©1995 HARRIS CORP.

Touch & Go!

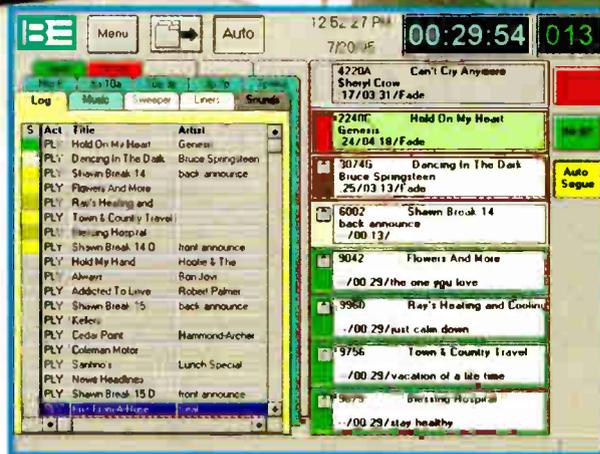
AudioVAULT

AudioVAULT is the world's most successful Digital Studio System, because AudioVAULT provides everything you need from digital technology. Customized to your operation, AudioVAULT gives your program director and on-air talent the freedom to do what they do best. And AudioVAULT is uniquely flexible to support your station's growth for years to come.



GO AVAIR! This is AudioVAULT AVAIR

...the most powerful, jock friendliest live radio tool in the digital radio world. Designed with maximum input from radio's top pros, for maximum live creativity and spontaneity. Customize and save AVAIR screens for every jock's individual needs. Run the wildest morning show. AVAIR gives your people the power to do everything you want them to do.



GO AWAY!

The other side of AVAIR...running automatically, sounding live. Music-on-hard-drive, net delay and playback...whatever you need to do, AudioVAULT handles it. And BE backs you up with 24-hour support, every day. You work better, sleep better.

GET GOING! AudioVAULT Digital Studio Systems start below \$9000.

Call your BE Digital Representative at 217-224-9600 (or fax 217-224-9607) and get the AudioVAULT 1995 Video and Demo Diskette.

BE BROADCAST
ELECTRONICS, INC.

WORLD LEADER IN RADIO BROADCAST TECHNOLOGY

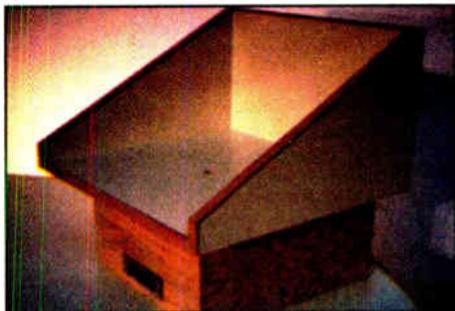
4100 N. 24th Street/P.O. Box 3606/Quincy, IL 62305-3606/(217)224-9600/Fax: (217)224-9607

MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional

Digital Turret From Spacewise

Spacewise Broadcast Furniture is now offering the DT-1, a studio accessory that allows eye-level contact with digital studio monitors. The DT-1 rotates 240



degrees and comes with a three and one-half inch floppy drive mounting bracket.

Options include a pull-out keyboard mount that fits under existing studio furniture and a three and one-half inch floppy drive and controller card. Spacewise also offers several choices of colors for the DT-1.

For more information, contact Peter Palagonia in Arizona at 800-775-3660; fax: 520-579-9877; or circle Reader Service 37.

New Quartz Crystal

Raltron Electronics has introduced a new ultra-thin quartz crystal for frequency

control in small, portable products. Because of a smaller crystal blank and new header base, the new Model H-10 has a smaller profile height and footprint area.

The crystals are rated at +/- 50 ppm at +25 degrees C and shunt capacitance is specified at 7.0 pF max. Factory selection among crystals produces fundamental frequencies from 16 MHz to 32 MHz, third overtones from 28 MHz to 84 MHz and fifth overtone frequencies from 84 MHz to 100 MHz.

For more information, contact Sandy Cohen in Miami at 305-593-6033, or circle Reader Service 42.

Philips Debuts Digital Sound Processors

The IS5021 and IS5022 digital sound processors from Philips combine a digital sound processor, sample rate converter and A/D and D/A converters into one compact package. A/D conversion is 20-bit, high-precision, while D/A conversion is also high-precision and completely linear.

The sample rate converter offers a choice of 44.1 kHz or 48 kHz output sampling frequency while 16-bit audio signals are improved by moving noise outside the



audible range. Both the IS5021 and IS5022 offer a comprehensive set of digital processing features and the IS5022 comes in a compact 1U rack-mountable package and is both AES/EBU (IEC958) and SPDIF compatible.

For more information, contact Hilarie Hackendahl in Illinois at 708-820-4800; fax: 708-820-8103; or circle Reader Service 88.

GPS Receiver for Precision Time Applications

New from Datum is the StarTime GPS Clock, consisting of an IRIG B time code output, one pulse per second (PPS) traceable time, front panel LED time and unit status display, and a standard RS-232 interface for remote on-site and off-site control.

At a size of less than two inches by seven and one-half inches by three

Aphex Introduces Compressor/Limiter

Aphex Systems has introduced the Model 661 Tube Expressor, a single-channel compressor/limiter that provides three compression curves and allows for higher compression ratios without the "dullness" usually associated with compression and limiting.

Switchable link modes include stereo link, master/slave link, and unlink. Side chain access is provided on the back panel and the nominal operating level is switchable from -10 dB to +4 dB with a bar graph output meter on the front panel.

For more information, contact Chrissie McDaniel in California at 818-767-2929; or circle Reader Service 84.



inches, StarTime's accuracy is better than two microseconds relative to the Universal Time Coordinated (UTC).

For more information, contact Richard Bailey in California at 714-533-6333; or circle Reader Service 91.

Broadcasters have problems. AEQ offers advanced solutions.



The BC-500 Mixing Console

- ▶ The AEQ Mixing Console BC-500 has in mind those radio stations seeking the best audio quality at a competitive price. Its designers paid great attention to the control layout.
 - ▶ Logical control design ensures a quick learning period as well as trouble free operation.
 - ▶ Advanced true modular design allows total flexibility.
 - ▶ The chassis incorporates built-in meters and speakers. The standard configuration includes the following features:
 - ▶ Six dual stereo inputs.
 - ▶ Four mono inputs (Mic/Line selectable).
 - ▶ One Telephone Hybrid interface.
 - ▶ Studio control Intercom monitor.
 - ▶ One main stereo output plus mono sum output.
 - ▶ Power supply for On Air signaling.
- The BC-500 provides 4 blank modules to enhance this configuration.



The MP-10 Portable Mixer

- ▶ Five transformer balanced inputs (Mic/Line selectable).
- ▶ Front panel input controls.
- ▶ Can be linked together to increase number of inputs.
- ▶ Transformer balanced outputs.
- ▶ Internal Ni-Cad rechargeable batteries provides 4 hour autonomy.
- ▶ Automatic switch to battery in case of power failure.
- ▶ Dual mode dialing keypad (tone/pulse).
- ▶ Three headphone output jacks.

Also from AEQ...

Broadcast automation system and hard disk audio storage, multi-standard Audio-codecs, Multiconference telephone systems, Broadcast mixing consoles, stereo audio monitors, line terminal equipment, power amplifiers...



The TH-02EX Mk-II Digital Hybrid

- ▶ Frequency Extender Mode as standard feature.
- ▶ Works with one or two telephone lines.
- ▶ Second line provides full Multiconference Mode. The operator and two callers can talk and listen to each other simultaneously.
- ▶ Hybrid null of 60 dB's.
- ▶ No adjustment required.
- ▶ Ideal companion for TLE-02 Portable Mixer.

The TLE-02 Portable Mixer

- ▶ On Air phone call with audio presence, depth and clarity of voice. No "telephone sound".
- ▶ Designed for non-technical users, ideal for field reporters.
- ▶ Light weight (3.3 Lb) and great autonomy, using 8 AA batteries.
- ▶ Dialing pad in front panel (pulse/tone selectable).
- ▶ Independent level control of Mic/Line input, auxiliary input and headphones.



AEQ AMERICA: 2211 South 48th Street, Suite H - Tempe, AZ USA 85282

Phone: (1 602) 431 0334 - Fax: (1 602) 431 0497

Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

AMPLIFIERS

Want To Sell

Denon DRA-400 tuner/amp, beautiful enclosed display with rosewood trim, exc condition, \$150. Ray, 941-923-8239.

Gates GTM-88R RF amplifier, \$50. B Preston, 503-947-3351.

Want To Buy

RCA BA-13A program amp w/shelf & knobs if possible. D Dintenfass, Transcription Service, 7549 27th Ave NW, Seattle WA 98117. Fax 206-784-6963.

Tube Hi-Fi, speakers, tubes. Altec, Marantz, McIntosh, Western Electric, coax/trix and corner speakers, tubes-VT-4C, 845's, etc. 405-737-3312 FAX: 405-737-3355.

TUBE EQUIPMENT, record cutting lathes. 612-869-4963.

ANTENNAS/TOWERS/CABLES

Want To Sell

280' tower, 13 sections of 20', 1 section of 10'. On the ground & ready to ship. Matching top beacon also available, call for details. D Lacy, Mtn States Broadcasting, Colorado Springs CO. 719-636-2470.

AM phasor. 2-twr in cabinet, plus misc ATU components. B Campbell, KRIG, POB 877, Bartlesville OK 74005. 918-333-7943.

Collins 37 hor 40 kW 4 bay 95.3; ERI-4 CP 95.3; Phelps Dodge 3 bay CP 100.95; JB Crawley, POB 185, Campbellsville KY 42719-0185. 502-465-5764 or 502-465-8884.

ERI 300', 3-1/8 rigid transmission line. \$2000. C Marker, WHWL, 130 Carmen Dr., Marquette MI 49855. 906-249-1423.

3" HELIAX STANDARD COAXIAL CABLE
50-Ohm, unused, cut to length. Priced below market. Shipped instantly.
Call Basic Wire & Cable (NANCY) 800-227-4292
FAX: 312-539-3500

Rohn 200', 20' sections, inc top light beacon, 2 side lights, bolts, guy cables, on the ground, gd cond. Barry, 207-255-3140.

1983 Jampro LP-2-bay, good low-cost low power 2-Bay antenna, FOB, Yreka, CA, \$1250. Fred Missman, 916-842-4158.

Andrew 87 N 1-5/8 coax to N female connector, \$50. R Sweatte, 509-586-8625.

ERI 4-bay FML Series Rototiller on 104.9 MHz, max input 9000 W, end fed, leg mounts, comes with stub for lightning protection, 25% off new price/Best Offer. E Joe Eck, Eagle Broadcasting, Box 69, Abilene KS 67410. 913-263-1560.

Scala CA5-FM yagi, (4) cut to 98.3 MHz, very broadband, used on 96.7 MHz, \$200 ea; Scala CA5-FM-EB, (4) 5-element yagi, rear mount, 9 dDd, \$200 ea; Scala PD4-2222 power divider, 4 output ports, \$100. D Magnuson, 423-525-6358.

New 1200' 2.25" Andrews air heliax with fittings, dehydrator, ground kits and hoisting grips. 919-781-3496.

FM-Antennas

Brand New, as low as 695.00 per bay
Jimmie Joynt
Factory Direct Sales
800/279-3326

Want To Buy

Any light weight 6 or 8 bay hor only on 98.5 MHz. F Hollon, WAHI, Rt 1 Box 72, Plymouth IL 62367. 217-392-2340.

High Power FM on or near 107.1, prefer 8, 10 or 12 bay; also high power FM, 8, 10 or 12-bay on or near 105.9. B Michaels, Unique Broadcasting, POB 2537, Bay City TX 77414. 409-244-4170.

300-500' & 100 or higher self supporting tower. P Lopeman, 414-482-1959.

FM antenna on 104.3, 1, 2 or 3 bay, low price, for back up antenna. P Deen, WAJQ, POB F, Alma GA 31510. 912-632-1000.

High power FM antenna on or near 107.1 FM, prefer 8, 10 or 12 bay. B Michaels, Unique Bldg, Bay City TX. 409-244-4170.

Six bay FM antenna for authorized power increase (99.3), cheap. M Coburn, KTOX, 520-855-9000.

AUDIO PRODUCTION

Want To Sell

California Digital Digimod 2000 cards, 1622-XT for Optimod 8100 w/XT chassis, new in box, \$750/BO. M Guthrie, WFNS, 7201 E Hillsborough Ave, Tampa FL 33610. 813-620-9100.

Eventide H-910 Harmonizer, old but works well, \$650. J Winters, Wintersound, 45 E Washington St, Elizabethtown PA 17022. 717-367-1119.

Lexicon PCM-70 classic reverb, \$1350; dbx 503 expander/comp, \$350; Roland SRV 2000 classic reverb, \$525/BO; Orban 245-E stereo synthesizer; Audimax & Volumax compressors, Altec 352-A vintage audio mixer, T Coffman, Rolltop Music, POB 17203, San Diego CA 92177. 619-571-5031.

ABC 32T pulsing unit, \$100. B Preston, 503-947-3351.

Linn Drum classic drum machine w/MIDI update, \$100; Adams-Smith Zeta III-B synchronizer w/cables for JH-24 & JH-110 recorders, recent software, \$950; Barcus-Berry 202-R sonic maximizers (2), rack mountable, Mark, 512-472-8975.

Spectro Acoustics 210 stereo graphic EQ, 10 bands, \$85; Furman LC-2 comp/limiter w/de-ess, adjustable attack & release, \$300; dbx-2-124 NR system, \$70; Teac AN-180 NR unit, \$65; Realistic stereo graphic EQ, 5 bands, \$35; Archer 15-278 video sound processor, \$35. D Jackson, WQQQ, Wilton, CT. 203-762-9425.

Turtle Beach 56K digital editor, 56K hard disk editor, fast & great sounding workstation for PC, 1 yr old, \$850. Keith, 504-595-8623.

Valley 400 mic processor, \$400. M Rollings, 314-968-4212.

dbx 166 stereo compressor, \$350. W Gunn, 619-320-0728.

Want To Buy

MXR-Neve-API EQ's, mic-pres, delays, etc. T Coffman, Rolltop Music, POB 17203, San Diego CA 92177. 619-571-5031.

AUTOMATION EQUIPMENT

Want To Sell

Cetec 7000 automation system with encoder & cables, (3) ITC PB reels with racks, (3) IGM 42 tray Go-Carts with racks, (2) IGM 24 tray Go-Carts with cks, printer & paper. All machines rebuilt & in good working condition, BO for all. T Yarbrough, WEDT, 1201 S College St, Winchester TN 37398. 615-967-2201.

SMC MSP automation system, works good, complete with all manuals, battery backup & 25/1000 Hz tone generator. SMC green racks (3) mdl 452 Carousel (2) ARS 1000 reel PB (3) single cart PB (2) 10 channel switcher. You pick up in Southern Virginia, \$2250. H Espravnik, WVCP, 1360 Nashville Pike, Gallatin TN 37066. 615-452-8600 or 615-452-3983.

CASSETTES • CARTS • REELS

J & I AUDIO/VIDEO

A wholesaler in the Radio and Television market. Now running SPECIALS on audio and video.

BASF CASSETTES-AMPEX R-Rs
AUDIOPAK, FIDELIPAC & ITC CARTS
DAT & THE NEW R-CD

For more information
call Kris Elliot at
1-800-942-1711

or write to: J&I Audio/Video
20899 Kelvin Pl,
Woodland Hills, CA 91367

Circle (125) On Reader Service Card

Computer Concepts 8x4 switchers (4), \$1800 ea; (2) Sentry Systems Air Sentry silent sensors, \$150 ea; Gentner silence sensor, \$300. M Rollings, 314-968-4212.

SMC DP-2 automation, 4 Carousels, 5 reel to reels; (2) SMC ESP-1 automation units, 4 Carousels, 4 reel to reels; SMC MSP automation, 3 Carousels, worked fine when replaced in 1994/5, all 4 units delivered to your Mainland USA site, \$6250. SBC, 600 N. Kiwanis, Sioux Falls, SD 57104. 605-334-1117.

Sonomag ESP-1, complete system, (3) model 350 Carousels, silence sensor, (3) reel to reel, computer, excellent condition, \$4000. L Mariner, 210-775-9583.

CART MACHINES

Want To Sell

ITC SP, stereo play, 3 tones; Tapecaster 700P, mono play, both guaranteed excellent condition with manuals, \$495/both. K Lamson, 510-447-7405.

Tapecaster RP, 6 hrs running time, as new w/secondary cue tone generator and detector. R Franklin, Supersound Studios, POB 1, Norristown PA 19404. 215-646-7788.

Tapecaster cart machines (2), 700-P, factory re-built, one spare motor, \$200 + shpg. B Barrett, KZPI FM, Deming NM. 615-399-8059.

UMC Beaucart 11-113-001 PB unit, good condition, \$175 including shipping. D Aloisi, Heart Radio Productions, POB 280, Purchase NY 10577. 914-698-5217.

BE stereo R/P, excel cond, \$600. G Miner, 719-632-3536.

ITC Series I, \$1200. M Rollings, 314-968-4212.

Tapecaster X-700 mono R/P with auxiliary tone generator & detector, \$500. R Franklin, Super Sound Studios, POB 1, Norristown PA 19404. 610-279-4515.

Tapecaster 700-P old style, \$400; Spolmaster Ten-70, has rapid recue feature, motor recently rebuilt, \$350, w/manuals, we'll pay shipping. Andy, 315-696-6550.

Tapecaster X7800RP & 700s, all in gd to excel cond, \$100-\$495. A Ishkanian, Focus on Truth, 1802 Hilliard Rd, Richmond VA 23228. 804-262-4330.

Great Prices on original equipment tape heads for ITC, BE, Fidelipac, Otari, Tascam & others!
(804) 984-4255
HE HALL Electronics

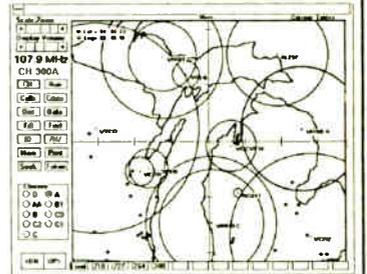
ITC record amps, 3 tone, stereo \$350 or mono \$250. W Gunn, 619-320-0728.

Want To Buy

ITC, BE, Fidelipac cart machines: single, triple, mono, stereo, play & record/play. Call M O'Drobinak @ 619-758-0888.

BROADCAST ENGINEERING CONSULTING SOFTWARE

Professional software packages for preparing FCC applications and plotting coverage. For Windows and DOS.



- ✓ Prepare concise FCC coverage maps and allocation studies from USGS digital line graph databases
- ✓ Search for AM, FM, and TV channels with professional graphics oriented programs and FCC databases
- ✓ Determine population with US Census databases
- ✓ Plot S.T.L. paths using NGDC terrain databases
- ✓ Tower and airport databases & more!

SoftCommunications

DOUG VERNIER
1-800-743-DOUG (3684)

Internet Access - WorldWide Web
<http://www.v-soft.com>
email: d.vernier@v-soft.com

CD PLAYERS

Want To Buy

Denon 950FA, working or not. P Lopeman, 414-482-1959.

COMPUTERS

Want To Sell

IBM PS/2 mdl 30, 286 machine ISA bus 1.4M floppy, 30M hard drive, 1M memory, BO/trade. P Cibley, 212-532-2980.

PC clones (6), 486 computers in several configurations, desk & tower, ram from 512K to 16MB, hard drives from 44MB to 2.3 gig. R Franklin, Super Sound Studios, POB 1, Norristown PA 19404. 610-279-4515.

Want To Buy

Tandy 6000 HD with at least one floppy drive. Mel Crosby, 408-363-1646.

CONSOLES

Want To Sell

Autogram IC-10 mono/stereo mixer, 28 stereo inputs, like new, BO. J Price, 214-321-6580.

Harris Stereo 80 console, \$300. KCMG, 800 N Hubbard, Mtn Grove MO 65711. 417-926-4650.

Russko 5 channel mono console, great shape, \$100 + shipping. B Barrett, KZPI FM, Deming NM. 615-399-8059.

Wheatstone A20 2 mic, 10 line, timer, line selector, A/B select, good condition, \$4500/Best Offer R Scott, WHFS, 8201 Corporate Dr, Landover MD 20785. 301-306-0991.

Altec 1567A tube-type mike mixer w/meter (vintage), \$350; Yamaha RM-804 recording mixers, 8 channels, \$400; Shure M-68P mic submixer, \$70. D Jackson, WQQQ, Wilton, CT. 203-762-9425.

Otari 50/50 BIII, 2 track, like new, \$3800; Panasonic 3900 DAT w/controller, like new, \$2250; Yamaha SPX900 effects reverb, like new, \$700. J James, 310-824-4846.

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

Gates Yard board, new tubes, \$395. W Gunn, 619-320-0728.

HE HALL Electronics The ONLY Source You Need for: Digital, Pro - Audio, & RF

706 Rose Hill Drive Charlottesville VA 22901

Please visit our Web Site at www.halls.com

E-Mail us!!!
jonh@halls.com
dwayne@halls.com
rick@halls.com
tech@halls.com

More than an FM exciter or amplifier, a Crown integrated FM transmitter system combines built-in audio processing and stereo generation in one rugged, compact unit. Each model provides excellent signal quality, ease-of-use and economical long-term reliability with a variety of features including:

- Quick set-up.
- Built-in digital metering and diagnostics.
- 87-108 MHz user-selectable frequency range.
- List \$5995.00

Also Available from Crown FM Translators Exciters

(804) 984-HALL (4255) Fax: (804) 984-FAXX (3299)

Call us for the Best New & Completely Rebuilt Equipment!

Circle (101) On Reader Service Card

CONSOLES...WTS

McMartin B-1082 8 chnl stereo, 18 inputs w/manual, exc cond, \$750. R Rocks, KEMC, Billings MT. 406-657-2941.

Want To Buy

API, Neve, whole or parts, working or not. T Coffman, Rolltop Music, POB 17203, San Diego CA 92177. 619-571-5031.

Manual/schematic for Quantum QM-22 console. M Craft, 941-954-1280.

Spare cards for an Audiotronics 110, specifically 1ME & SpF4. D Webb, KESY, 4807 Dodge St, Omaha NE 68132. 402-556-6700.

DISCO-PRO SOUND EQUIPMENT

Want To Sell

EV MS-802 monitor speaker systems, (2), woodgrain, btl, \$500/pr. (2) Jensen bookshelf speaker, approx 12" x 20", \$50. D Jackson, WQQQ, Wilton, CT. 203-762-9425.

Want To Buy

Electro-Voice 15W or WK woofers, dead or alive; early 18" Jensen or Motograph field-coil woofers; JBL LE-8's w/original Lansaloy surrounds; Older RCA field-coil compression drivers (grey bodies). B Rosenow, KTTs, POB 2180, Springfield MO 65801. 417-865-6614.

FINANCIAL SERVICES

DO YOU NEED CASH to fund new or used equipment? Call 1-800-549-8539 for FREE RECORDED MESSAGE, 24 hours, to hear about our quick approval, fixed-rate, long and short-term lease-to-own programs. Then you can apply by FAX, 24 hours a day.

EQUIPMENT FINANCING ON ALL RADIO EQUIPMENT

- Easy to qualify
- Fixed-rate, long-term leases
- Any new or used equipment
- 100% financing, no down payment
- No financials required under \$50,000
- Refinancing existing equipment



Call Mark Wilson (800) 275-0185

FINANCING

LOANS BY PHONE (800) 699-FLEX

- We finance all types of Broadcasting Equipment
- Flexible Credit Criteria
- Flexible Payment Plans
- No Down Payment. No Payments For 90-Days Available

To apply or request additional information call Jeff Wetter.

FLEX LEASE, Inc.

LIMITERS

Want To Sell

Audimax 4440-A compressor; Volumax 4000A compressor. T Coffman, Rolltop Music, POB 17203, San Diego CA 92177. 619-571-5031.

Gates M-6467 FM Top Level. \$50. B Preston, 503-947-3351.

GE BA-9-B Uni-Level amp (tube compressor), 6386, 6AL5, (2) 6V6, 5Y3-GT, gd cond, \$150. R Franklin, Super Sound Studios, POB 1, Norristown PA 19404. 610-279-4515.

Orban Optimod 8000A, exc condition, manual incl. \$1795. C Ellington, 334-867-4824.

Want To Buy

Gates, Inovonics, Fairchild, RCA, UREI, Teletronics (all types), solid state & tube. T Coffman, Rolltop Music, POB 17203, San Diego CA 92177. 619-571-5031.

Gates M6467 FM top level amplifier. F Hollon, WAHL, Rt 1 Box 72, Plymouth IL 62367. 217-392-2340.

Optimod 8100A, working or not. P Lopeman, 414-482-1959.

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 214-271-7625.

MICROPHONES

Want To Sell

AKG D-140 dynamic cardioid mics. \$225/pr. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

RCA microphones, 44, 77 & BK-5, also RCA 90-A floor stand. W Davies, 818-761-9831.

Sennheiser Binaural MKE 2002 mic with head & all adapters & cables, excellent condition with carrying cases. \$300. J Swartz, Face Company, 237 Frost Ave, Rochester NY 14608. 716-235-4928.

EV PL20 (RE20) mics, good condition, \$325; RCA 77DX mics, re-conditioned with new ribbons; Neumann KM84 pair. W Gunn, 619-320-0728.

Altec/WE 9-A mic swivel for 633A/B mics, new, in original box, Best Offer. R Franklin, Super Sound Studios, POB 1, Norristown PA 19404. 610-279-4515.

Lapel mikes, condensor/piezoelectret in pouch, 3 with Canons out, 2 with phone plugs, \$65; Shure 571 dynamic lapel mike with tie clip, long cord. Canon out, red velvet-type bag, \$30; Shure 444T controlled magnetic desk mike, grey with PTT bar & gain control grey, \$25; Astatic T-UG8-D104, chrome finish, stand with PTT bar, new in box. D Jackson, WQQQ, Wilton, CT. 203-762-9425.

Want To Buy

RCA 77 DX, Shure green bullet original. T Coffman, Rolltop Music, POB 17203, San Diego CA 92177. 619-571-5031.

77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights & audition lights. Top price paid. Fast response. Bill Bryant Management, 2601 Hillsboro Rd. G12, Nashville TN 37212. 615-269-6131, FAX: 615-292-3434.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST. 214-271-7625.

MISCELLANEOUS

Want To Sell

THE BIRTHDAY LIST

Over 4,000 B-days from AC, CHR, CR, ROCK, COUNTRY, OLOIES, actors, famous people & more. Real names, AKAs & their bands. Stay fresh & localized. Laser printed & ready for your 3-hole binder. Send \$36.95 & \$3.00 s+h to: **B-Day List** PO Box 1234, Mt. Shasta, CA 96067

Audiometrics ABO 560CD lazy susan wire CD rack, 6' high, holds 560 CDs, excellent condition, 27 1/2" radius. \$300 plus freight. Larry, 717-523-1190.

AUDIO TRANSFORMER MAGIC

9K 600-6
amlisar
P O Box 1561 Bellevue WA 98009
206-454-2040

Circle (78) On Reader Service Card

SMC ESP-1 printed circuit cards for DS-20 switcher; also Mdl 452 Carousel. R Statham, WHLG, 1000 NW Alice Ave, Stuart FL 34994. 407-692-1000.

Want To Buy

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, Nyny 10003. 212-674-3060.

Manual for Digital DSP-103 TBC with schematics; RCA bdg limiter manual & schematics; Ball TE9RT 7-010-0105 schematics. R Perrine, Imagination Industry, 2475 State Rd #22, Cuyahoga Falls, OH 44223. 216-929-3712.

UTC input bridging xmtrs such as A-18, A-19, HA-104, HA-106, LS-19, LS-21, LS-40. Any single piece. L Blackmon, RQ Studio, Larson Rd #4, N Reading MA 01864. FAX 508-668-8973.

RECEIVERS & TRANSCEIVERS

Want To Sell

Conex 25 Hz tone decoder/sensor, \$100 + shpg; Gorman-Redlich EBS encoder/decoder, adaptable, \$100 + shpg. B Barrett, KZPI FM, Deming NM. 615-399-8059.

SCA RECEIVERS—ALL TYPES

Reading Service / Ethnic / Data Professional / Table Will work to meet your receiver needs

DAYTON INDUSTRIAL CORP. (Manufacturer) 2237 Industrial Boulevard Sarasota, FL 34234 Tel: 813 351 44545 FAX: 6081

Repro repeater, VHF/UHF duplex. S/A receiver, 4/0 series with spectrum display with 423 plug-in freq 2200-2300; mono 410 (3) less spectrum disp. Best Offer/trade of educational radio station gear. Barry, 207-255-3140.

Surplus R1051D/URN receiver 2-30 MHz. Best Offer or trade. Barry, 207-255-4722.

Avcom SCPC 2000E receiver, \$450; Voice cue card for Dart 384 receiver, \$100; 15 KHz card for Dart 384 receiver, \$100. B Preston, 503-947-3351.

Kenwood 150-170 MHz hand held radios, will set up on your RPU freq, \$200. P Deen, WAJQ, POB F, Alma GA 31510. 912-632-1000.

Nakamichi SR4A stereo receiver, as new w/remote and papers. \$300. Ray, 941-923-8239.

Want To Buy

Potomac FIM-21, will pay \$2000 cash. B Walker, 713-452-5645. Marti remote broadcast equipment & antenna. M Grubbs, KRNH, 1216-A Sidney Baker, Kerrville TX 78028. 210-896-4990.

RECORDERS

Want To Sell

Ampex ATR-700 2 chnl mono, no visible head wear, solenoid switches oxidized. Best Offer. C Kocsis, 703-913-9143.

UHER 4400 Report Monitor, current model in excellent condition. \$650; UHER 4400IC stereo, as is, \$125. S & G Electronic, 215-474-7663.

Recorded Pro V mono, 16:1, 1 master 14 slaves in 3 units. \$2400; Tascam MS 2640, master & 5 stereo slaves, chrome or Ferrex, \$3900, excellent condition. Custom Recording, 803-295-2011.

REVOX PARTS/SERVICE

Cassette-CD-Open reel NOS PR99 repros. Capstan resurfacing, ALL BRANDS. **JM TECHNICAL ARTS** 30 Music Sq. W. #156 Nashville, TN 37203 (615) 244-6892

Revox A-77 (4), some work, some for parts, \$100/BO. M Grubbs, KRNH, 1216-A Sidney Baker, Kerrville TX 78028. 210-896-4990.

Studer A710 stereo cassette deck, Dolby B & C, \$595. R Sumner, CAVU Corp, 44632 Guilford Dr, Ashburn VA 22011. 703-450-2288.

Studer B-67, 7.5-15-30 ips. 1/4" 2-trk complete with remote control, owners manual & transport cover, unused for few years, has been fully serviced & in excellent condition with good heads. \$1600. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

CLEAN PATCH BAYS NO DOWN TIME



VERTIGO BURNISHERS AND INJECTORS RESTORE ORIGINAL PERFORMANCE TO YOUR PATCH BAYS

\$34.95 Ea. **VERTIGO RECORDING SERVICES** 12115 Magnolia Blvd #116 818-907-5161 North Hollywood, CA 91607 818-784-3763

Studer A274 4 track, R-R, as new. \$2600. 4 tracks of Dolby SR NR, \$1000. R Scott, WHFS, 8201 Corporate Dr, Landover MD 20785. 301-306-0991.

Teac 4-trk R/P, vgc, \$500. J Winters, Wintersound, 45 E Washington St, Elizabethtown PA 17022. 717-367-1119.

Ampex ATR 800, excellent condition. 3 speed, 1/2 track, 1/4", you ship, \$1600. G Mininger, 719-632-3536.

NEED PARTS FOR METROTECH DICTAPHONE LOGGERS
call **SEQUOIA ELECTRONICS**
1-(408) 363-1646
FAX 1-(408) 363-0957

Nakamichi BX-300 discrete 3-head pro cassette deck, perfect condition, \$350 or B/O. Ray, 941-923-8239.

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

CORNELL-DUBILIER MICA CAPACITORS

FROM STOCK

JENNINGS VACUUM CAPACITORS

FROM STOCK

JENNINGS VACUUM RELAYS

SURCOM ASSOCIATES

2215 Faraday Ave., Suite A Carlsbad, California 92008 (619) 438-4420 Fax: (619) 438-4759

...country, top 40, news, urban, talk, jazz, the classics, mixed bag...

RADIO! The beat goes on!

CROUSE-KIMZEY OF ANNAPOLIS

tops in broadcast equipment
1-800-955-6800
ask for Kathleen

DIGITAL STUDIO FURNITURE AND COMPONENTS REAL DIGITAL STUDIOS

BROADCAST PODIUMS THE BEST REMOTE SETUP IN THE BUSINESS

STUDIO UPS SYSTEMS SHORT OR LONG TERM, COMPUTER MONITORED

SPACEWISE™
"THE BROADCASTERS FURNITURE STORE"
800-775-3660

RadioWorld

Call Simone Mullins, Classified Ad Manager, to reserve space in the next issue. Use your credit card to pay, we now accept VISA and MASTERCARD.

5827 Columbia Pike, 3rd Floor Falls Church, VA 22041 • PHONE: 703-998-7600 • FAX: 703-998-2966

Select from these categories for best ad positioning:

- | | | | |
|----------------------------|------------------------|---------------------------|--------------------------|
| Acoustics | Computers | Receivers & Transceivers | Tax Deductable Equipment |
| Amplifiers | Consoles | Recorders | Test Equipment |
| Antennas & Towers & Cables | Disco-Pro Sound Equip. | Remote & Microwave Equip. | Transmitter/Exciters |
| Audio Production (Other) | Financial Services | Repair Services | Training Services |
| Brokers | Leasing | Satellite Equipment | Tubes |
| Business Opportunities | Limiters | Software | Turntables |
| Cart Machines | Microphones | Stations | Positions Wanted |
| CD Players | Miscellaneous | Stereo Generators | Help Wanted |
| | Monitors | Tapes, Carts & Reels | |

Classified Advertising Rates Effective January 1, 1995

	1x	3x	6x	12x	
1-9 col inch (per inch)	\$60	58	54	49	To compute ad costs: Multiply the number of ad inches (columns x inches) by the desired rate schedule for your per unit cost. Example: a 3" ad at the 1x rate is \$180, at the 3x rate \$174, at the 6x rate \$162, at the 12x rate \$147, etc.
10-19 col inch (per inch)	55	52	49	44	
Distributor Directory	100	95	90	85	
Professional Card	65	60	55	50	
Classified Line Ad			\$1.50 per word		
Blind Box Ad			\$10 additional		

RECORDERS...WTS

Otari ARS 1000 2 channel PB R-R. \$400. Otari MX 5050 BQ II. 4 channel R/P R-R. 9 years old. excellent condition. \$2500. J Travis. WC/K. POB 506. Bath NY 14810. 607-776-4151.

Teac Tascam 80-8. 8 channel. 1/2" tape reel to reel. \$1300; (2) Ampex 1091 stereo. \$50 ea; Wollensak 2770 cassette duplicator (stereo unidirectional). \$250; Pentagon 1100 series. 4 channel cassette duplicator. \$350; Sony TC-142 portable cassette deck. \$130; Sony TC-152D 2-speed stereo cassette deck. \$130; Wollensak 2851 cassette recorder/playback, heavy duty. Best Offer; Realistic high power video/audio bulker 44-133. new. \$25; (2) Dukane 28A18 recorder/pulser, 50 Hz @ 0.45/2.0 sec. Best Offer. D Jackson. WQQQ. Wilton, CT. 203-762-9425.

Nagra 4-S stereo sync machine. \$4500. W Gunn. 619-320-0728.

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

Otari 5050-SHD 8 trk 1/2" newly rebuilt, heads have full life left. \$1800. W Gunn 619-320-0728.

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

REMOTE & MICROWAVE EQUIP

Want To Sell

Moseley 505 transmitter and Marti STL-8 receiver. \$1050. D Jackson. WQQQ. Wilton, CT. 203-762-9425.

WE RENT
TELOS ZEPHYR
CCS "Prima" Codecs
Stereo RPU, NO License
Frank Grundstein
Audio/Video Consultants
COMREX
4 Line Extender
610-642-0978

Zercom telephone hybrid, never used. \$250 + shpg. B Barrett, KZPI FM. Deming NM. 615-399-8059.

RENT IT HERE! Call Steve Kirsch for Details
COMREX 1, 2 & 3 Line Extenders Digital Codecs
TELOS Zephyr Digital Phone Hybrids
GENTNER EFT 3100 3 Line Extenders
SHURE FP 410 Automatic Mixers
REMOTE AUDIO PACKAGES
SILVER LAKE AUDIO • 516-763-1776 • FAX: 516-763-1750

Sine Systems with dial out & voice card. \$1000. M Rollings. 314-968-4212.

Gentner G2500 1 year old, super hybrid, built in mix minus, digital hybrid. \$1300; Gentner SPH-3 (2) telephone hybrids, one black & one beige, like new. \$350 each. J Travis, WC/K. POB 506, Bath NY 14810. 607-776-4151.

Studer automatic hybrid. 2 line telephone interface with manual. \$495; Comrex PLX portable single line frequency extender. \$250. R Sumner, CAVU Corporation, 44632 Guilford Dr, Ashburn VA 22011. 703-450-2288.

Want To Buy

SCA generator & demod. 110 kHz for STL. Marti SCG10/SCD10, Moseley SCG8/SCD8 or equiv. J Sullivan, WKJR, 800-566-4811.

Marti RPU receiver & transmitter, working or not, reasonable price. P Deen, WAJQ, POB F. Alma GA 31510. 912-632-1000.

Marti system VHF or UHF, working or not. P Lopeman, 414-482-1959.

BOOST YOUR SALES

Advertise in the Classified Section ~ You'll be impressed with the results!

SATELLITE EQUIPMENT

Want To Sell

Scientific Atlantic AD-7550. \$1000; Micro Phase MP2030S. \$400. M Rollings. 314-968-4212.

SATELLITE SYSTEMS

Satellite Equipment for Radio

Satellite Systems repairs all major brands of satellite equipment, including the Fairchild Dart 384 and Scientific Atlanta 7300. Our turn-around time averages 24-hours. Plus, we provide pre-and post-service technical support along with a 90-day warranty (with exception of shipping charges).

Satellite Systems sells Zephyrus SCPC, Jones Satellite Networks, the Ariel and other available models. Just call and ask!

Satellite Systems, Inc.
615 East Brookside
Colorado Springs, CO 80906
(719)634-6319 Ex: (719)635-8151

UNIVERSAL SPCPC XE-1000
NEW!
SCPC BROADCAST AUDIO RECEIVER
New, affordable, frequency-agile receiver, direct channel entry by keyboard, selectable companding 1:1, 2:1, 3:1, wide/narrow bandwidth, de-emphasis selectable, 950-1450 MHz, line output 600 ohms, muting, transponder agile, LNB power supply, 50-channel memory, full baseband output, high-quality audio. Every needed feature at a sensible price (lowest in the industry). Write or call for full information on this quality receiver—the answer for your station. Networks call for prices.
Phone: (614) 866-4605 Fax: (614) 866-1201

UNIVERSAL ELECTRONICS, INC. 4555 Groves Road, Suite 12 Columbus, OH 43232
Communications Specialists Phone: (614) 866-4605 Fax: (614) 866-1201

Adcom 7010 FM demod SCPC cards. Best Offer; Colorado Magnet-ics Satcue 400 with ribbon cable & manual. Best Offer. T Gayne, KTMC, POB 848, McAlester 74502. 918-423-1400.

Offsat/Comtech parabolic antenna, 18', transportable, C-band, mint condition. Tony. 305-888-4883.

Want To Buy

Sedat card for Fairchild Dart 384 receiver. GM, KWED, POB 1600, Seguin TX 78155. 210-379-2234.

SOFTWARE/ DATABASES

Want To Sell

RADIR: THE RADIO STATION DATABASE

11,950+ stations, more accurate than any yearbook & prints mailing labels! Many searches, gives phones/faxes/web site addresses & more. MS-DOS or MAC (tab delimited ASCII) \$129.95 ppd. INCLUDES QUARTERLY UPDATES: 1-800-277-8224
Internet: http://www.okeinfo.com/bbh/info

Affordable TRAFFIC & BILLING

PC SOFTWARE for DIGILINK & other popular digital systems. Excellent for non-automated stations, too. Try it for 60 days. No obligation. For demo, call ABA Software (813) 643-3689

Circle (102) On Reader Service Card

STATIONS

Want To Sell

5 kW AM, 1410 kHz, 200+ W night. 2 tower DA, Cuba MO, perfect owner/operator possible, serious inquiries only, \$135,000. K Kuenzie, KFXE, 511 W 5th St, Washington MO 63090. 314-239-6800.

PARTNER/INVESTOR SOUGHT FOR PAN-EUROPEAN TV & RADIO NETWORK. FAX +31-20-6381789

5 kW AM station, 1410 kHz/200+ watts night, 2 tower DA, Cuba MO, owner/operator FM possible, \$135,000 serious only, K Kuenzie, KFXE, 511 W 5th St, Washington MO 63090. 314-239-6800.

CONSULTANTS

Consulting Communications Engineers
• Station improvement and modernization
• FCC Applications and Field Engineering
• Frequency Searches and Coordination
• AM-FM-CATV-ITFS-LPTV
OWL ENGINEERING, INC.
1-800-797-1338
1306 W. County Road, F, St. Paul, MN 55112 (612)631-1338 Member AFCCE

EVANS ASSOCIATES
Consulting Communications Engineers
TV • FM • AM • ITFS • Satellite
FCC Applications, Design and Field Engineering
Video/Data/Voice • Light Fiber & Microwave • Wide-Area Networks & STL's
210 S. Main Street
Thiensville, WI 53092
(414) 242-6000 • FAX (414) 242-6045
Member AFCCE

GRAHAM BROCK, INC.
BROADCAST TECHNICAL CONSULTANTS
Full Service From Allocation to Operation
AM/FM/TV/AUX Services:
Field Work: Antenna and Facilities Design
Over 35 years engineering and consulting experience
912-638-8028
202-393-5133

PC - SOFTWARE
AM FM TV Search Programs
Signal Mapping—STL Paths
RFHAZ—US Census PopCount
FAA Tower—Draw Tower
Doug Vernier
Engineering Consultant
1600 Picturesque Drive
Cedar Falls, IA 50613
800-743-DOUG

North America RF & Audio
Mirkwood Engineering Services
Broadcast and Telecommunications Consultants
Multidiscipline Engineering and Planning Firm including • Application & Allocation Services
• Project, Engineering & Construction Management • Site Acquisition
• Rural & Remote Site Installations
• Field Service • Studio Design & Installation
50 Park Ave. Claremont, NH 03743
(603) 542-6784

SERVICES

- Propagation Services
- FM Studies
- Population Studies
- FCC/FAA Databases
- PC Software

Communications Data Services, Inc.
800-441-0034
703-534-0034
fax 703-534-5497
6105-E Arlington Blvd.
Falls Church, VA 22044

HARRIS ALLIED
PARTS AND TECHNICAL SUPPORT
Now we can be reached online via e-mail.
TSUPPORT@HARRIS.COM
For your parts needs or with any technical problems you're having.

Tower Sales & Erection
Tower, Site Design, Installation & Maintenance
AM FM Broadcast TV
Microwave Links
Antennas & Towers
TOWERCOMM
Communications Specialists
Ben Wall President
6017 Trade Dr
Raleigh, NC 27613
(919)81-3496
Gen. Contractors, Inc. Fax: (919)81-8454

MLJ
Moffet, Larson & Johnson, Inc.
Consulting Telecommunications Engineers
1110 North Glebe Rd. #800
Arlington, VA 22201
(703) 741-3500
FAX: (703) 741-0312
Member AFCCE

TELECOMMUNICATIONS CONSULTANTS
ALLOCATION STUDIES
AM, FM, TV, LPTV
▼ Applications ▼ Appraisals ▼ Inspections ▼ Local & Wide Area Computer Network
Microwave Design ▼ Specialized Computer System Designs
W. LEE SIMMONS & ASSOC., INC.
44 Bow Circle #B, Hilton Head Is., SC 29928
803-785-4445 fax 803-842-3371

MULLANEY ENGINEERING, INC.
Consulting Engineers
• Design & Optimization of AM Directional Arrays
• Analysis for New Allocation, Site Relocation, and Upgrades
AM-FM TV LPTV
Wireless Cable (MDS/MMDS/ITFS/OFS)
• Environmental Radiation Analysis
• Field Work
• Expert Testimony
9049 Shady Grove Court
Gaithersburg, MD 20877
Phone: (301) 921-0115
Fax: (301) 590-9757

FM TRANSMITTER HELPLINE
24 Hour Emergency Phone Consultation
Specializing In:
• CCA/CSI
• Arcing Problems
• ALL FM Transmitters
MBE Enterprises
Phone: 818-772-8017
Pager 818-604-7925

REMOTE BROADCASTS IN THE U.K. AND EUROPE
Planning remotes from the U.K. or Europe?
we offer a one-stop service
• we organize venues for your shows
• we provide temporary equipment
• live links via ISDN/Switched 56
• experienced radio engineers
• we help you line-up guests
Contact London (44) 181 442 8900
Wired for Sound Ltd., London U.K.

E. HAROLD MUNN, JR. & ASSOCIATES, INC.
Broadcast Engineering Consultants
AM - FM - TV
WAYNE S. REESE
PRESIDENT
Box 220, 100 Airport Rd.
Coldwater, MI 49036
517-278-7339

T. Z. Sawyer Technical Consultants
AM-FM-TV-LPTV
• FCC Applications & Exhibits
• Experimental Authorizations
• AM Directional Antennas
• High Power Antenna Arrays
• Frequency Studies
• Class Upgrades
• STL Applications
• Station Inspections
1-800-255-2632
FAX: (301) 913-5799 • 6204 Highland Dr. • Chevy Chase, MD 20815

REMOTE EQUIPMENT RENTALS
COMREX and GENTNER
1, 2 & 3-Line Extender Systems
Now With The New TELOS ZEPHYR
MARTI VHF/UHF RPU Systems
ISDN & Switched-56 Systems
Call or FAX Dwight Weller
WELLER AUDIO-VISUAL ENGINEERING
Baltimore, Maryland
Phone: (410) 252-8351
FAX: (410) 252-4261

Contact Radio World Newspaper for advertising space availabilities
703-998-7600
P.O. Box 1214 Falls Church, VA 22041
World Radio History



STATIONS...WTS

New Low Power Television station for sale in fast-growing Fort Myers, FL. JHF Channel 57, great coverage of market with 15,800 watts. All new equipment, asking \$265,000. Skinner Broadcasting Inc, (800) 881-0047.

Want To Buy

FM or Regional AM in WI, MI, IN, OH, or IL, CP's, dark or troubled OK. P Lopeman, 414-482-1959.

Retired couple seeks small East Coast AM & FM combo w/R/E troubled or dark OK, 718-893-4328.

STEREO GENERATORS

Want To Sell

Gentner Lazer, \$4500. M Rollings, 314-968-4212

STUDIOS

Technics RS1500 combo 2 track R-R & 6x4 mixer, good condition, complete portable studio. G Mininger, 719-632-3536.

TAPES/CARTS/REELS & CD's

A&D Cart Rebuilding
Do Bad Carts Have Your Temperature Rising?
Let A&D clean, load & pack your carts. They'll be serviced within 10 working days! *Guaranteed!*
3706 Vold Ct. 715-835-7347
Eau Claire WI 54701 Fax: 715-835-1151

Want To Sell

Christmas music on 10.5" reels. Emphasis on traditional carols & songs of Christ's birth. Ampex 406 tape with box & accompanying playsheet for \$2.50 + shipping. R Snavely, Family Life Network, POB 506, Bath NY 14810. 607-8776-4151.

Fidelipac Mastercart & Model 300 carts, various lengths, most pre-recorded. Sale below reasonable cost; metal carousel racks & wooden rack. J.P. Meadows, 423-453-2844.

Pams Jingles reference tapes from the years of 1951-1976, avail from every radio market in the US, Canada & Europe, call after 3PM CST, 214-271-7625.

Classic rock library from 60's & 70's on vinyl, cassettes, reels, \$250. Empty 7 & 10.5" reels new & used, \$35 + shipping. D Pulwers, 703-578-3014.

TEST EQUIPMENT

Want To Sell

Henry Mix-Minus box, new, \$40 + shpg. B Barrett, KZPI FM, Deming NM. 615-399-8059.

HP 141 spectrum analyzer with 8553, 8532 plug-ins, Tek Scope 5110 with 5A15N (2) 5b10N time base; PR57 Sencore Powerit, Phoenix mico System 5500 data communications analyzer, Tek 520A vectorscope, Tek 147 NTS gen. Best Offer/or trade for educational gear or recording studio equipment for educational station. Barry, 207-255-4722.

Potomac Instruments AM-19 2 trw antenna monitor, \$1000. B Campbell, KRIG, POB 877, Bartlesville OK 74005. 918-333-7943.

Potomac Instruments AA-51 audio analyzer w/IX-51 input transformer, \$1200. R Sumner, CAVU Corp, 44632 Guilford Dr. Ashburn VA 22011. 703-450-2288.

HP 130C rack mount, oscilloscope, \$200. P Deen, WAJQ, POB F, Alma GA 31510. 912-632-1000.

Trilithic 700A signal level meter, Best Offer; Peca ACM 719XE field strength meter, 54-216 MHz, 470-890 MHz, Best Offer; Jerrold 704B field strength meter 54-220 MHz, Best Offer. J Whatley, WNUZ, Alexander City AL. 205-234-2492.

Want To Buy

McMartin AM-25 AM noise meter. R Sweatle, 509-586-8625.

TRANSMITTERS

Want To Sell

CCA FM-10000D 10 kW FM transmitter, less exciter. Includes spares, harmonic filter, directional coupler & AC panel breaker boxes, call for details. D Lacy, Mountain States Broadcasting, Colorado Springs CO. 719-636-2470.

Gates BC1F 1000 watt AM transmitter, \$1000. KCMG, 800 N Hubbard, Mtn Grove MO 65711. 417-926-4650.

Power Pax FM exciter, 5-30 watts, works great, tuned to your frequency, \$400 + shipping. B Barrett, KZPI FM, Deming NM. 615-399-8059.

RCA 5 kW transmitter, just removed from service, works great, you haul, \$4900. G Wyatt, WPSL, 8245 Business Park Dr, Port St Lucie FL 34952. 407-340-1590.

1983 Elcom-Bauer 603, 3 kW FM, excellent condition, 3-phase converted to single phase, tuned to 97.7, exciter included, FOB, Yreka, Calif. \$5995. Fred Missman, 916-842-4158.

FM-Transmitters
Translators & Amplifiers
Solid State 15 watt to 6 Kw.
Jimmie Joynt
Factory Direct Sales
800/279-3326

McMartin 8-910 10 W exciter with stereo audio input module, SCA module, manual, \$300. R Rocks, KEMC, Billings MT. 406-657-2941.

CCA ELECTRONICS
NEW SPECIALS!
AM1000D 1KW AM \$11,000
AM5000HF 50KW \$ CALL!
AM SHORTWAVE
CCA DEMOS
FULL 3 YEAR WARRANTY!
FM100G 100W SS \$2,100
FM4000G1 4KW FM \$19,500
4800W Max Output
USED TRADES
Harris FM20H3 20KW \$18,000
FM with QEI exciter
Harris FM10H3 10KW \$9,500
PARTS
T-12A Vacuum Xtal. \$500 ea
for CCA & Gates AM
Call Darrin,
Steve or Howard
770-964-3530

Tepeco J317-2 & TTC XL10-FM, FM translator stations plus 100 W PA & 30A power supply, \$2500 ea. W Bird, 406-256-8850.

QEI amplifiers, exciters and stereo generators. All are reconditioned and are tuned and tested on your frequency. 6 month warranty is included. If you want quality used equipment, call or fax 609-232-1625 and ask for Bob Brown.

CONTACTORS BY "GELECO"
Ph: (416) 421-5631
Fax: (416) 421-3880

Used equipment for sale: Belar SCM-1, Belar RFA-1, Belar FMS-1, Belar FMM-1, Moseley MRC 1600 system, TFT EBS receiver/generator, Gentner patch panel, and Harris racks. Call Transcom Corporation 800-441-8454 or 215-884-0888.

Want To Buy

CSI or CCA 12 kW, 20 kW or 27.5 kW FM. J Wilkinson, 801-231-7099.

1 kW AM reasonable, will pick up within 200 miles of Savannah GA. FM solid state exciter, working or not, reasonable price a must. P Deen, WAJQ, POB F, Alma GA 31510. 912-632-1000.

QEI 675 or 695 exciter. P Lopeman, 414-482-1959.

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

TUBES

Want To Sell

D and C Electronics Co.
Lowest Price on Tubes including:
4-1000A/3-1000Z/
8877/4CX250B/833A
4-500/5-500/4-400/
4CX 3500/5CX1500
and much more!
Factory Warranty!
1-800-881-2374
(904) 688-2374
Se habla Español
FAX: (904) 683-9595

4X150A, 4CX250B, 4-400, 4-1000, 807, 833, 8874, 8877, RCA, AmpereX, EIMAC, etc. Westgate 800-213-4563.

Premier Eimac Remanufacturing
Have Your Power Tubes
Remanufactured by the Original Manufacturer
• Factory Processing
• Factory Testing
• Original Specifications
• New-Tube Warranty
Worldwide Availability Through
Richardson Electronics, Ltd.
(708) 208-2200
Call 800-414-8823
Int'l. (415) 592-1221
or Fax 415-592-9988
Call 800-414-8823
Int'l. (415) 592-1221
or Fax 415-592-9988
Circle (140) On Reader Service Card

Svetlana ELECTRON DEVICES
Quality* Power Tubes
3CX15000H3 4CX400A
3CX15.000A7 4CX350AC
3CX15.000A3 4X350A/8321
3CX15.000H3 4CX250R/7580W
3CX10.000H3 4CX250BT
3CX10.000A7 4CX250BM
3CX3000F7/8162 4CX250BC/8957
3CX3000A7 4CX250B 7203
3CX2500H3 4X150A/7034
3CX2500F3/8251 5CX1500B
3CX2500A3/8161 5CX1500A
4CX15.000A/8281 YC130/9019
4CX15000J 8560AS
4CX10.000D/8171 811A
4CX5000A/8170 833A
4CX3500A 833C
4CX1600B SK300A
4CX1500A SK1300
4CX800A SK1320
Watch this list grow.
Shipment from USA stock.
Manufactured in Russia's largest power tube factory.
Generous warranty based on high quality.
Honest prices based on quality at low cost.
Broadcasters
Phone: 800-239-6900
205-882-1344
FAX: 205-880-8077
OEMs, Distributors
Phone US: 800-578-3852
Int'l & US: 415-233-0429
FAX: 415-233-0439
Circle (188) On Reader Service Card

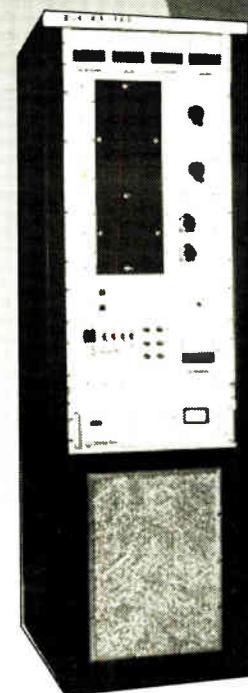
ADVERTISE in RADIO WORLD'S Broadcast Equipment Exchange
CALL SIMONE: 800-336-3045

TRANSCOM CORP.
Serving the Broadcast Industry Since 1978
Fine Used AM & FM Transmitters and Also New Equipment
For the best deals on Celwave products, Andrew cable and Shively antennas.

1 kW FM 1978 Collins 831C-2	1 kW AM 1966 Gates BC1G
2.5 kW FM 1978 Harris FM2.5K	5 kW AM 1979 Continental 315-F
2.5 kW FM 1983 Harris FM2.5K	5 kW AM 1978 Harris MW5A/B
4 kW FM 1978 CCA 40E	5 kW AM 1977 RCA BTA 5L
5 kW FM 196? Gates FM5B	10 kW AM 1974 CSI T-10-A
10 kW FM 1968 RCA BTF 10D	
10 kW FM 1971 Collins 830F-1B	
20 kW FM 1974 Collins 831G-2/Cont 816R-2	
20 kW FM 1968 RCA BTF 20E	

1077 Rydal Road #101
Rydal PA 19046
800-441-8454 • 215-884-0888 • FAX No. 215-884-0738

If you think a new, top quality FM transmitter is expensive... Think Again!



In Powers to 11 KW

- Reliable Grounded Grid Design
- Solid State IPA Doubles as Emergency Transmitter
- Simple Straight Forward Controller
- VSWR Foldback & Protection
- Automatic Power Output Control
- Built-in Line Surge Protection
- Field Proven Standard Parts
- BUDGET PRICED !**

The "ECO Series"... has ARRIVED!

"The Transmitter People"
Energy-Onix
518-828-1690
FAX: 518-828-8476
752 Warren Street, Hudson NY 12534

TUBES...WTS

REBUILT ELECTRON TUBES
 Partial List: 6623, 23791, TH150, 6425F, 5604, 6696, 6697, 5681, 5682, 5671, 7804, 3CX10,000H3, 3CX20,000H3, 4CX5000A, 4CX35,000C

Worn out power tubes purchased

Vacuum Tube Industries, Inc.

1-800-528-5014
508-584-4500 X75

ECONCO

Quality Rebuilt Tubes
 Approximately 1/2 the Cost of New

Call for Our Price List
800-532-6626
916-662-7553
FAX 916-666-7760

Circle (19) On Reader Service Card

TURNTABLES

Want To Sell

Technics SP-25, good condition, \$250; Audio-Technica ATP-12T professional tone arm, like new, \$150. R Franklin, Super Sound Studios, POB 1, Norristown PA 19404. 610-279-4515.

Technics SP25 with se & arm, Best Offer. T Gayne, KTMC, POB 848, McAlester 74502. 918-423-1400.

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

Page No.	Advertiser	Reader Service No.	Page No.	Advertiser	Reader Service No.
10	360 Systems	206	1	Harris Allied	15
57	AEQ	110	38	Harris Allied	126
30	AETA	60	20	Henry Engineering	120
6	ATI	108	44	IFR Systems, Inc.	168
44	ATI	25	58	J&I Audio/Video	125
32,33	Arrakis	103	46	Joslyn Jennings Corp.	119
25	Arrakis	87	36	J-Squared	71
22	Audio Broadcast Group	146	53	Listen Up	70
46	Audio Broadcast Group	75	29	MPR Teltech	54
59	Audisar	78	14	Marti/Broadcast Electronics	211
63	Auditronics	158	36	Micro Communications, Inc.	118
44	Autogram Corporation	3	54	MicroCon Systems	143
36	B&K Installations	21	46	Monroe Electronics	142
52	Belar	77	53	Mouser Electronics	190
46	Benchmark Media Systems	194	37	Murphy Studio Furniture	148
44	Broadcast Computer Distributor	122	15	Musicam USA	100
20	Broadcast Devices, Inc.	145	26	Musicam USA	179
56	Broadcast Electronics	67	35	National Public Radio	99
27	Broadcast Electronics	2	48	Neumann USA/Sennheiser	92
4	Burk Technology	33	11	Neutrik	128
61	CPI	140	53	Nott Ltd.	166
44	Circuit Werkes	26	18	Orban	73
19	Clark Communications	44	49	Pacific Recorders	161
20	Coaxial Dynamics	74	53	Phasetek	124
34	Computer Concepts Corp.	106	21	Potomac Instruments	7
3	Comrex	150	53	Pristine Systems	172
44	Comrex	98	40,41	Prophet Systems	214
16	Conex Electro-Systems	184	47	QEI	205
13	Continental Electronics	116	28	Radio Spirits	28
51	Crown Broadcast	210	23	Radio Systems	157
17	Cutting Edge	196	12	Roland Corp.	4
45	Dataworld	35	20	S.C.M.S.	52
21	Dataworld	176	48	Satellite Systems	46
62	Econco	19	8	Scott Studios	53
44	Econco	27	36	Shively Laboratories	6
61	Energy-Onix	68	43	Signal One	165
46	Excalibur	51	36	Silicon Valley Power	213
43	EZ Sound	76	50	Studio Audio Digital Equipment	114
53	Factory Direct Sales	195	61	Svetlana Electron Devices	188
20	Factory Direct Sales	5	53	Svetlana Electron Devices	141
42	Fostex	137	24	Tapscan	95
39	Gentner	197	7	Telos Systems	121
43	Ghostwriters	18	31	Telos Systems	55
53	Gorman Redlich	215	20	The Management	189
38	Group W Satellite Comm.	23	45	The NASDAQ Stock Market	117
58	Hall Electronics	101	61	Transcom Corp.	198
46	Hallikainen & Friends	72	43	Valentino	41
52	Harris Allied	50	19	Ward Beck Systems Ltd.	11
9	Harris Allied	89	64	Wheatstone	208
30	Harris Allied	34	2	Wheatstone	201
16	Harris Allied	163	53	Will-Burt	45
55	Harris Allied	191	44	Zercom	29

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: _____

POSITIONS WANTED

Available: pro anncr, network voice, former VOA, can do combination of announcing, master cntrl in radio or TV, exc voiceover delivery. Alex, 513-777-8423.

Broadcasting young gun w/1 yr exper plus strong production/copywriting background seeks position. John 405-848-7626.

Country/AC morning AT/promotions, topical/humorous/adult communicator. Women 25-54 & phones! Mike 510-432-6300.

Equipment installer looking for position. Have experience with broadcast, audio, video & telecommunications equipment. Would consider freelance status. D Chapar, 203-698-0508.

Morning man, news, production, copywriter, PD, over 23 yrs exper. Easy listening, country format wanted, all markets, locales considered. Larry Kay, 717-653-2500 (evenings/weekends).

Network radio pro looking for new challenge, young, enthusiastic & exper, can wear many hats, on air/sales/mgmt, sports, newstalk, all formats. Rob 703-256-4623.

Young, fresh out of school, looking to start at your stn as on-air, prod talent, willing to relocate. Louis, 405-739-0551.

Ready to make a move, 15 yrs in business, exp on-air, prgmmg, prod and engineering, major mkt background. Dade, 713-448-6912.

CE w/12+ exper seeks employment, AM/FM, group or similar communications position. 303-772-3916.

HELP WANTED

Engineer Virgin Islands with: Harris 10 kW FM transmitters, combiners, satellites; RF; and computer skills, send cv, salary needs, etc to: Chairman, PO Box 333, Miami FL 33280.

HELP WANTED

Starting FM station in Dillingham, Alaska just went on the air! Looking for someone to help out. Write to: Jackson/McCormick KRU.P, Box 157 Dillingham AK, 99576 or Fax us at 907-842-5518

WBQB/VA Radio in Fredericksburg, Virginia seeks experienced chief engineer. Must have superior command of AM/FM RF, state of the art audio, digital and computer automation. FCC compliance knowledge a must. Renovated physical plant. Competitive salary/benefits package. Start November 13. Resume to General Manager, WBQB/WFVA, P.O. Box 269, Fredericksburg, VA 22404. EOE.

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 \$60/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.

Mail to: **BROADCAST EQUIPMENT EXCHANGE,** PO Box 1214, Falls Church, VA 22041 Attn: Simone Mullins

SUBSCRIPTION/READER SERVICE FORM



FREE Subscription/Renewal Card
I would like to receive or continue receiving Radio World FREE each month. Yes No

Signature _____ Date _____

Please print and include all information:

Name _____ Title _____

Company/Station _____

Address _____

City _____ State _____ ZIP _____

Business Telephone () _____

Please check only one entry for each category:

I. Type of Firm

D. Combination AM/FM station F. Recording Studio

A. Commercial AM station K. Radio Station Services

B. Commercial FM station G. TV station/teleprod facility

C. Educational FM station H. Consultant/ind engineer

E. Network/group owner I. Mfg, distributor or dealer

J. Other _____

II. Job Function

A. Ownership G. Sales

B. General management E. News operations

C. Engineering F. Other (specify) _____

D. Programming/production

Reader Service

November 25, 1995 Use until February 25, 1996

Please first fill out contact information at left. Then check each advertisement for corresponding number and circle below.

Purchasing Authority

1. Recommend 2. Specify 3. Approve

001	023	045	067	089	111	133	155	177	199
002	024	046	068	090	112	134	156	178	200
003	025	047	069	091	113	135	157	179	201
004	026	048	070	092	114	136	158	180	202
005	027	049	071	093	115	137	159	181	203
006	028	050	072	094	116	138	160	182	204
007	029	051	073	095	117	139	161	183	205
008	030	052	074	096	118	140	162	184	206
009	031	053	075	097	119	141	163	185	207
010	032	054	076	098	120	142	164	186	208
011	033	055	077	099	121	143	165	187	209
012	034	056	078	100	122	144	166	188	210
013	035	057	079	101	123	145	167	189	211
014	036	058	080	102	124	146	168	190	212
015	037	059	081	103	125	147	169	191	213
016	038	060	082	104	126	148	170	192	214
017	039	061	083	105	127	149	171	193	215
018	040	062	084	106	128	150	172	194	216
019	041	063	085	107	129	151	173	195	217
020	042	064	086	108	130	152	174	196	218
021	043	065	087	109	131	153	175	197	219
022	044	066	088	110	132	154	176	198	220

Publisher	Stevan B. Dana	Ad Traffic Coordinator	Kathy Jackson
Associate Publisher	Carmel King	Ad Production Coordinator	Lisa Lyons
Marketing Consultant	Al Leon	Production Assistants	Trina Masters, James Comett
Marketing Assistant	Eva Marie Kreil	Ad Coordination Manager	Simone Mullins
Production Director	Lisa Stafford	Circulation Director	Eleya Finch
Publication/Desktop Systems Mgr	Julianne Shannon Stone	Circulation Manager	Steven Bowman
Classified/Showcase Production Coordinator	Vicky Baron	Accounts Receivable	Steve Berto

Advertising Sales Representatives

U.S. East: Skip Tash 703-998-7600 Fax: 703-998-2966

U.S. West: Dale Tucker 916-721-3410 Fax: 916-729-0810

International: Stevan B. Dana +1-703-998-7600 Fax: +1-998-2966

Europe: Dario Calabrese +39-2-7030-0310 Fax: +39-2-7030-0211

Japan: Eiji Yoshikawa +81-3-3327-2688 Fax: +81-3-3327-3010

Free Subscriptions are available upon request to professional broadcasting and audiovisual equipment users. For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

Radio World Broadcast Equipment Exchange

Is read by over 18,000 Broadcast Equipment Users Every Month! Sell Your Used Equipment Here. Call or

Telephone **703-998-7600**

FAX **703-998-2966**

FAX Simone Mullins for Information on Affordable Advertising Rates.

INTRODUCING THE AUDITRONICS 2500 SERIES THE LAST SMALL CONSOLE YOU'LL EVER HAVE TO BUY



Some people believe small means limited. At AUDITRONICS we believe small is a challenge. That's why we have again defined a new standard of excellence by combining impeccable design, precision manufacturing, and value pricing in a full featured, compact audio console. The 2500 Series is loaded with all of the "me too" features found in the competition's "wannabe world class" consoles. Plus the 2500 Series delivers much more, including:

- **SOLID STATE SWITCHING** of all signal paths
- **DC CONTROL** of all level functions
- Telephone **CONFERENCING** capability
- **20dB HEADROOM** maintained throughout
- Easily accessible wiring on **MOTHERBOARD CONNECTORS**
- **ACTIVELY BALANCED** input, patch points, and floating outputs
- Linear **CONDUCTIVE PLASTIC** 100mm faders (P & G Standard)
- Comprehensive **A/B EXTERNAL LOGIC** control
- External line selector with **CUE AND HEADPHONE ASSIGNMENT**

And remember, AUDITRONICS is the company that still supports the first console it ever sold -- over 28 years ago. So you no longer have to compromise with a "wannabe". With the 2500 Series you get the real thing!

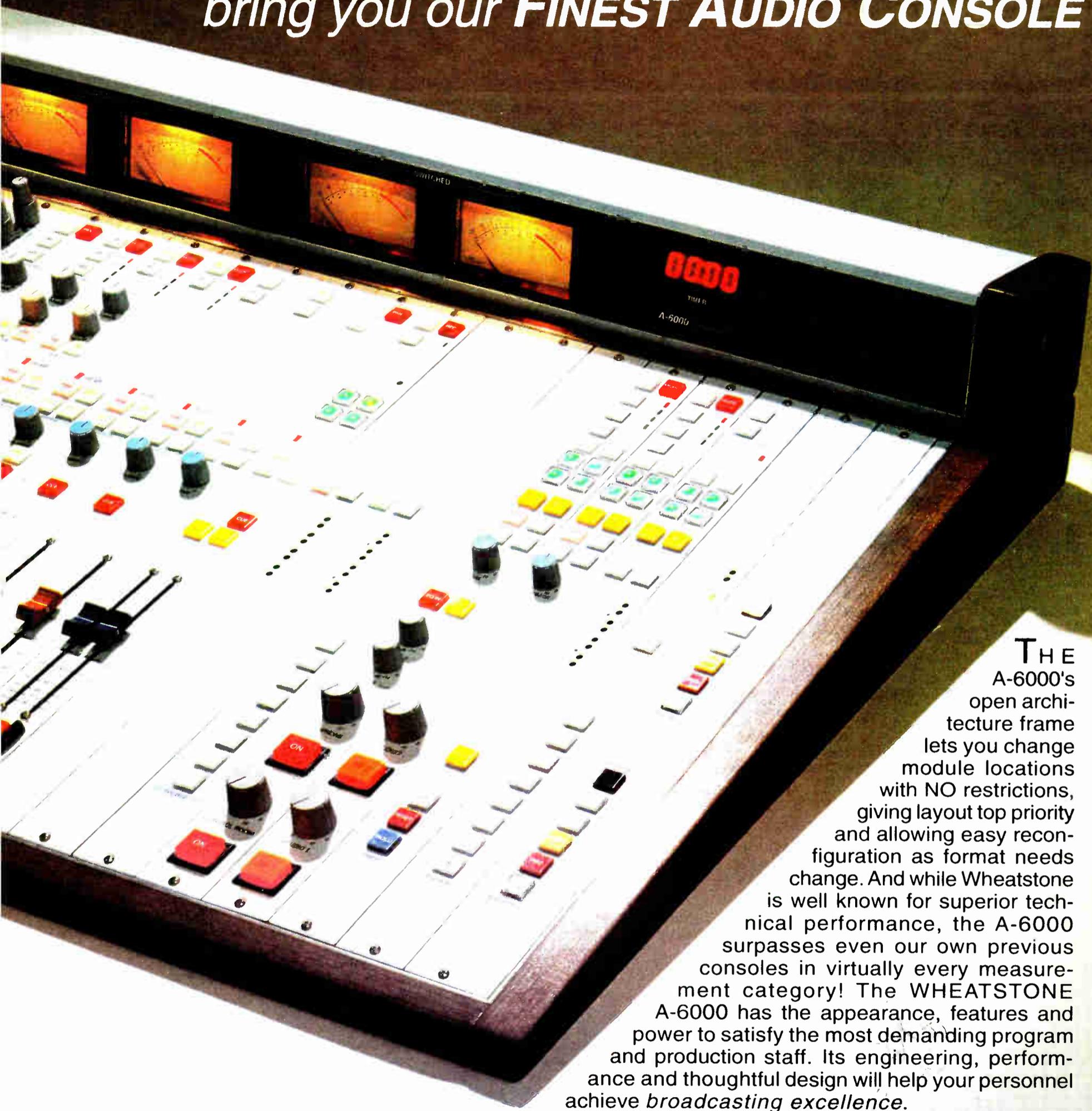
THE ONLY WORLD CLASS CONSOLE AVAILABLE AT "wannabe" PRICES.

AUDITRONICS 3750 Old Getwell Road, Memphis, TN 38118 (901) 362-1350 FAX (901) 365-8629

Circle (158) On Reader Service Card

World Radio History

*We've taken all we know, all you've asked for,
and the very best of today's technology to
bring you our **FINEST AUDIO CONSOLE***



THE A-6000's open architecture frame lets you change module locations with NO restrictions, giving layout top priority and allowing easy reconfiguration as format needs change. And while Wheatstone is well known for superior technical performance, the A-6000 surpasses even our own previous consoles in virtually every measurement category! The WHEATSTONE A-6000 has the appearance, features and power to satisfy the most demanding program and production staff. Its engineering, performance and thoughtful design will help your personnel achieve *broadcasting excellence*.

A - 6 0 0 0 B R O A D C A S T C O N S O L E

7305 Performance Drive, Syracuse, NY. 13212
(tel 315-452-5000 / fax 315-452-0160)

 Wheatstone Corporation

Circle (208) On Reader Service Card

World Radio History