Radio World®

Workbench

RF Maintenance Ideas

See Page 32

Vol 21, No 23 | Radio's Best Read Newspaper | November 12, 1997

Industry Argues Main Studio Rules

by Leslie Stimson

WASHINGTON One of the radio issues that new FCC commissioners will have to tackle is the pending rulemaking to relax the main studio and public file rules.

Broadcasters have been prolific in comments to the FCC on the subject. Here is a sampling of the latest comments from stations and citizen groups, other than NAB, on which RW has previously reported.

Several broadcasters said their listeners communicate with them by telephone, fax mail or over the Internet and rarely visit the main studio. Therefore, they said the current restrictions are archaic and expensive.

"By permitting licensees with multiple stations in the same market to co-locate their main studio, the commission could eliminate unnecessary travel time for those residents of a station's county who first visit a centrally located studio, only to find that, in order to visit a sister station's main studio, they must travel to its separate location within that particular station's greater contour," stated Jim Hooker, CEO, Pride Communications, a five-station group in Illinois.

Permitting licensees with multiple stations in a market to co-locate their main studios would also "eliminate trips that Pride employees must make at least once a day to maintain a sister station's main facility."

Combining the main studios of Indiana stations WXCH(FM) and WSCH(FM) would eliminate the cost of maintaining two main studios and save about $20,000 a year, which could be used for either adding another newsperson or upgrading equipment, wrote President/General Manager John Schuler.

Of the proposal to allow a main studio location to be anywhere within the principal community contour of any station licensed to the same community, this proposal wouldn't be fair to stations that are the only ones licensed to their community, stated Cornerstone Community Radio. Cornerstone and other commenters suggested a main studio be allowed anywhere within a fixed radius.

Several commenters agreed that a fixed mileage standard would be the easiest rule to understand and administer. Most stations suggested a range of between 40 to 50 miles.

"Fifty miles can be reached in under an hour and most residents are used to traveling such distances," wrote both the North Carolina and Virginia Association of Broadcasters. The associations favored the mileage standard over the current principal community contour rule.

"Whether a station is located in a station's principal community contour has no bearing on whether that studio is accessible to community residents."

Not so fast ...

But, maintaining an "accessible studio ... is an inherent cost of doing business," stated opponents.

Opposing the mileage standard were the: United Church of Christ, Media Access Project, Center for Media Education and the Minority Media and Telecommunications Council in a joint filing opposing elimination of the rule. "Existing rules may be needlessly rigid, but new rules must not impose stringent deterrents to personal visits by listeners .... (The main studio) must be

See MAIN, page 7 ▶

Satellite Radio Proceeds

by Leslie Stimson

WASHINGTON Despite objections about foreign ownership and potential coverage problems, both companies that won a federal auction to provide satellite-delivered digital audio radio services (DARS) now have FCC documentation in-hand that says they can move forward.

American Mobile Radio Corp. and Satellite CD Radio each paid for their licenses in three installments. The last payments were due Oct. 16; shortly afterwards, the FCC authorized both companies to build, launch and operate satellites to provide DARS services.

CD Radio

CD Radio has been waiting since 1990 for a license. The firm plans to have its system up by late 1999.

In filings to the FCC and SEC, CD Radio detailed changes in its ownership structure. In May, the FCC

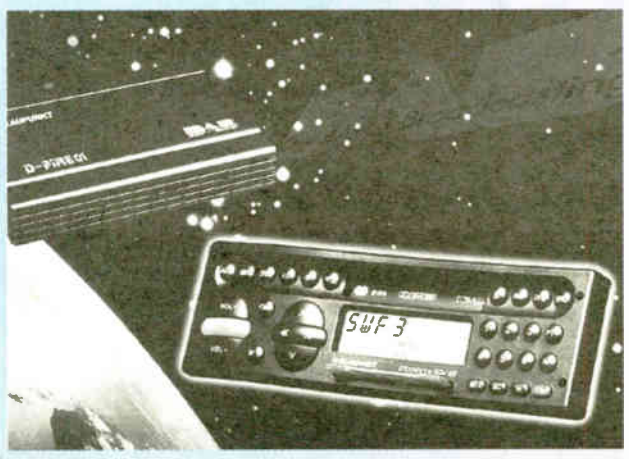
See DARS, page 3 ▶

DAB Makes European Commercial Debut

by Marguerite Clark

BERLIN DAB receivers are ready. Well, sort of.

Manufacturers unveiled consumer digital audio radio receivers at the Internationale Funkausstellung (IFA) consumer electronics show in Berlin in late summer. But questions about consumer acceptance remain. Meanwhile, participants in the DAB debate in the United States are watching foreign developments closely, for some indication of how audiences and manufacturers would respond to DAB.



By Jan. 1, 1998, more than 100 million people in Europe will be within reach of DAB broadcasts, according to the WorldDAB forum, which represents more than 100 members and organizations from 25 different countries.

Furthermore, DAB services will be on the air in Canada and tests will be taking place in Australia, India, China and Singapore.

According to WorldDAB President David Witherow, in-depth market research conducted by the organization in France, Germany, Italy and the Netherlands indicates that consumers would be willing to pay more for the quality promised by DAB.

The survey found that consumers would be prepared to pay 30 to 50 percent more for DAB-capable car radios, and as much as 80 to 100 percent more for portable DAB receivers.

More than one-third of those interviewed said they were regular car drivers who would be very interested in a DAB car radio if it provided interference-free reception and CD-quality sound.

See DAB, page 6 ▶

It's the '90s: You have more to do with less time to do it. Days are hectic. You juggle so many tasks in the studio, you feel like you're a ringmaster in a circus—not a DJ on a *live* radio show. You wonder if the madness will ever end. Then you think, "There's gotta be a better way."

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World Radio History

NEWSWATCH

Kline, OmniAmerica Join in Tower Biz

COLUMBIA, S.C. Kline Iron & Steel has sold one-third of its business to OmniAmerica Wireless. OmniAmerica was formed by Carl Hirsch and Anthony Ocepek, along with group station operator Hicks, Muse, Tate & Furst, to build, acquire and manage broadcast and telecommunications towers (RW, Oct. 1).

The Kline-OmniAmerica deal was expected to close in October. The purchase price was not disclosed.

The deal included Kline Towers, which designs and fabricates tall broadcast towers; Kline Structural, which fabricates and erects structural steel for industrial and commercial buildings; and Kline Coatings, which applies high-performance coatings to structural steel.

"The alliance with Kline fits neatly with OmniAmerica's strategy to create a vertically-integrated company that not only designs, fabricates and erects steel towers, but also owns towers that lease tenant space to broadcasters and telecommunications companies," said Hirsch. "Outstanding opportunities exist in what is currently a fragmented industry with very few qualified players."

The deal, said Hirsch, "positions OmniAmerica to accelerate the build-out and infrastructure conversion to digital television in the U.S. and abroad."

Kline will continue doing business under its current name, with Jerome Kline retaining his position as chairman/CEO.

NAB: Ease Drug Ad Regs

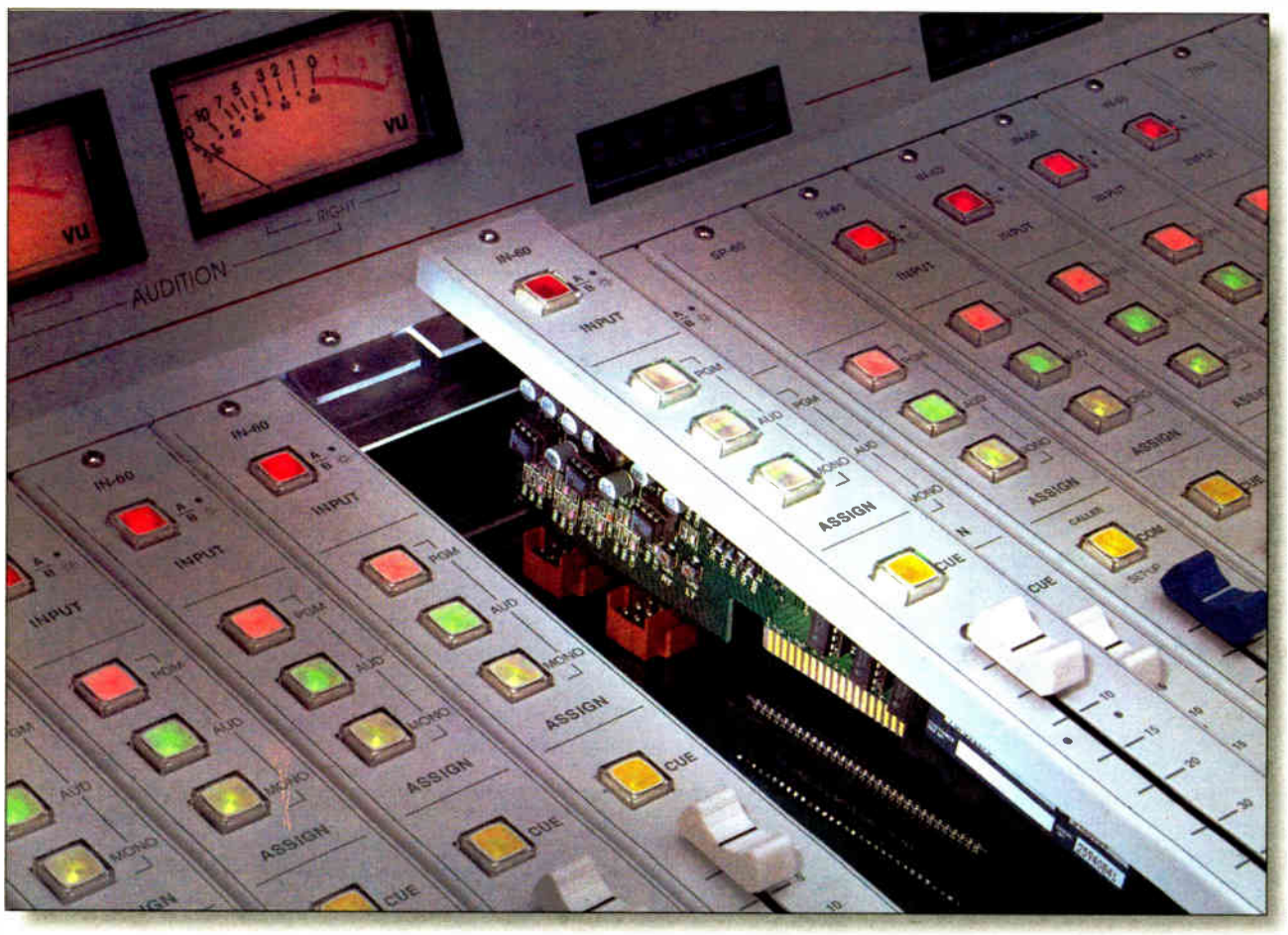
WASHINGTON The NAB supports a Federal Drug Administration proposal for disclosing information in radio and TV prescription drug ads. In comments filed with the FDA, NAB said the guidelines would provide "greater efficiency and clarity" for broadcasters and advertisers who seek to comply with FDA ad rules.

Currently, such ads must include a statement of major risks and either a brief summary of contraindications or "an 'adequate provision' for the dissemination of the approved or permitted package labeling in connection with the broadcast ad."

NAB said "adequate provision" is not defined, forcing advertisers to use a brief summary or resort to a less effective "reminder advertisement." A reminder ad doesn't have to list a drug's major risks and side effects, but it can only call attention to the name of the product, without dosage recommendations.

If adopted, the FDA proposal would let radio and TV spots meet regulations by offering consumers a toll-free number, brochure locations and an Internet address where they can access label packaging information.

Take a LOOK at THIS:



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DIM	
Mic & Line, +16dBu	.005%
DYNAMIC RANGE	
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Index

STUDIO SESSIONS

East-West Revives Sampling Fun by Alan R. Peterson 12

Technical Considerations of DVD by Mel Lambert 12

Casting CDs in the Sonic Foundry by Carl Lindemann 14

Valentino Presents New Library 19

AES COVERAGE

Product Roundup From the Big Apple by Alan R. Peterson 21

AES Looks at Digital Radio by Alan R. Peterson 29

FEATURES

Melting Metal: Solder but Wiser by Stephen H. Lampen 30

Workbench by John Bisset 32

There's Trouble in E-Mail City by Barry Mishkind 33

Enjoy This Thorough DA Primer by W.C. Alexander 40

Perils of Early Phono Cartridges by Ronald Pesha 44

RUNNING RADIO

Moto-Photo Pictures Radio Rewards by Claudia Tucker 45

Jazz Seeks Commercial Foothold by S. D. Yana Davis 45

The Next Broadcast Network? by Alan Haber 46

Nature's Fury, on Your Website by Peter M. Zollman 51

Local Focus Can Lead to Profits by Marlin R. Taylor 52

Don't Shoot the Messenger by Mark Lapidus 54

The 'Five Femmes' of WNEW by Vince Santarelli 55

Give 'Em a Reason to Buy by Dick Taylor 56

BUYER'S GUIDE

The DA-302 Is on the Horizon by Don Elliot and Ann Schwab 58

What's Replacing the Carts? by Read G. Burgan 59

Source Gear for Your Studio 60

World Radio History

Library Adds Godfrey Collection

by Leslie Stimson

COLLEGE PARK, Md. The Broadcast Pioneers Library of American Broadcasting has scored a coup, acquiring the personal mementos of the late Arthur Godfrey.

The collection, consisting of about 800 linear feet of material, includes at least 250 kinescopes, plus wire recordings, musical scores and business papers that belonged to the radio and TV entertainer. It is the largest single collection obtained to date by the institution.

"We should have the Godfrey collection on-site by mid-November, and then it will be accessible to the public a few months later," Mike Mashon, project curator for the library, said.

Godfrey left the collection to WNET-TV in New York when he died. WNET and the library have agreed to co-own the collection, because the library has the space to display the material at its site on the University of Maryland campus.

Since moving its headquarters from the National Association of Broadcasters building to the university campus in 1994, curator Mashon and other employees have been cataloging and adding to the collection. Unlike other broadcasting collections, this one focuses on paper items, such as business records, audio collections, photos, books, magazines and scrapbooks of former radio and TV industry employees.

Visitors to the library will find more than documents, though. The library also holds audio recordings of ads, programming, newsgathering and the personal recollections of hundreds of broadcasters. The largest element of this collection is several thousand transcription disks of vintage commercials donated by the Radio Advertising Bureau.

To preserve the original recordings, library employees play them just once, recording them onto a reel-to-reel master, submaster and a DAT copy, all stored separately.

"Many times, broadcasters turn to us for promotional material or when they're putting together a history book to mark a station anniversary," Mashon said.

There is some vintage radio equipment at the library, but gear takes up a lot of space, so library employees often refer potential equipment donors to local radio collectors.

Broadcasters and the public can use the library by phone, the Internet or a visit to the library in College Park. Approximately 500 people came through the library's doors last year, and three times that sent e-mails. The library's website (*www.lib.umd.edu/UMCP/LAB*) sees about 5,000 "hits" a month, according to Mashon.

An on-going project is the digitizing of old photos to make them accessible on the library's website.

All library information is free for those who plan to use the material for a non-commercial project. A schedule of nominal fees applies for commercial uses.

The Broadcast Pioneers organization began collecting materials for the library in 1964, well before the library's capitalization in 1971. In 1991, Mashon said, the library was in financial straits. The Taishoff family established a $1 million trust fund to re-capitalize the library, which now operates off the interest.

Library of American Broadcasting, Univ. of Md.

AMRC, CD DARS Plans Good to Go, Says FCC

▶ DARS, continued from page 1

granted CD Radio an exemption from the commission's cut-off rule, allowing CD to issue additional stock. In August, CD obtained financing from its satellite vendor, Loral, which then bought stock in CD's corporate parent, CD Radio Inc. In September, CD said it expected to implement a public stock offering and share conversion soon.

According to its latest filing, about 32 percent of CD Radio Inc. is owned by non-U.S. citizens. CD Radio said the percentage of foreign ownership will decline to about 15.5 percent after it completes its public offering and conversion of preferred shares to common stock, below the 25 percent limit for foreign ownership spelled out in the Communications Act.

The FCC found that giving CD Radio the license, even before CD reduced its foreign ownership, was in the public interest, and rejected opposition from several parties, including Primosphere, a failed bidder for a DARS license.

"Most of CD Radio's foreign ownership is divided between Loral (roughly 15 percent) and Chairman/CEO David Margolese, a Canadian citizen, (12.7 percent)," stated the FCC. The commission found the other foreign minority interests to be widely dispersed; that factor, and the presence on the board of a majority of U.S. citizens, convinced the FCC that the company has a "dominant U.S. presence."

In asking the FCC to deny CD Radio a license, NAB argued that CD Radio would be "unable to provide service to urban areas and will only be able to provide service to rural areas and suburban areas with south-facing windows because its proposed link margin will not provide high quality service." The FCC said NAB didn't prove its case and stated that CD would use "spatial diversity and time diversity to avoid outages from blockage, multipath and tree foliage. ... In core urban areas and tunnels, CD intends to augment its DARS transmissions implementing terrestrial repeaters."

AMRC also intends to use terrestrial repeaters; the FCC plans to decide how to regulate those later.

On its website, a message from Margolese stated, "CD Radio will not operate as a common carrier of programming, but will in fact originate most of its programming itself." The company plans to offer 50 subscription channels: 30 commercial-free music and 20 talk.

AMRC

AMRC first filed for a DARS license in 1992. The principal shareholders of AMRC Holdings are American Mobile Satellite Corp. (AMSC) and WorldSpace. Majority shareholder AMSC is a U.S. licensee in the Mobile Satellite Service, and its affiliates are Hughes Telecommunications & Space Co. and Delco Electronics Corp. AMSC is publicly traded and has established an alliance with WorldSpace.

Primosphere also opposed a license to AMRC, alleging that AMRC appeared to be "fronting for WorldSpace or some other foreign investor." The FCC said Primosphere's sole proof was a Business Week article, and added that "sources such as magazine articles are insufficient" to deny the license.

The commission also rejected CD Radio's complaint that AMRC's system "would severely interfere with receiving facilities in Canada." The FCC stated that cooperation with "foreign systems is unavoidable but achievable."

AMRC plans to launch its satellite by the end of 1999 and have its service operable in 2000.

AMRC also plans to offer 50 channels and "is actively working with a number of programmers," said President Lon Levin.

As to whether DARS would compete with terrestrial, over-the-air broadcasters, Levin said: "With all the consolidation, (stations) are thinking about their next quarter. Even though NAB has a mandate to stop this, they did their best. They raised the issue ..." But, he said, "The licenses are here."

Levin does expect some competition with radio stations, but not for the local audience. "With CD players and cassette players in their cars, people like to have a choice. ... This is just another choice, not the death of local broadcasters."

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World Radio History

Harris Expo Targeted Radio, TV

WASHINGTON The small town of Richmond, Ind., once again played host to the Harris Broadcast Expo, last month.

And this year, my fourth straight year to attend, undoubtedly was the strongest Expo yet. A combination of trade show, seminars and networking forum, the event this year had parallel television and radio tracks, and drew roughly 350 attendees from as far away as Virginia!

The historic Clarion Leland Hotel once again provided the backdrop to 40 vendors and the aforementioned attendees. A Richmond landmark, the hotel is beautiful and centrally located. I think, however, that the crowd lured by the technical advice and

Arrakis' Rod Graham and RW's Sandy Harvey talked shop on the floor.

nuts and bolts sessions as well as the free lunch, dinner and exhibit floor, maxxed out the Leland this year. If the Harris show grows by a single person, it will have to move to the small convention center in Richmond.

Pitfalls of growth

What sets this expo aside from the larger trade shows is the "smallness" of it. Here, engineers and managers can spend time with a Jon Young or Roderic Graham of Arrakis or a Lynn Distler of Comrex and receive unrushed answers to their questions — something few vendors can offer at a trade show like the spring NAB show or an IBC or, well you understand what I'm saying.

Kudos for the success of the Harris Expo go squarely to Dave Bums, Studio Product Manager for Harris Broadcast Division.

The event did focus on radio, with digital

Glynn Walden explained IBOC DAB to attendees.

radio in the forefront. Broadcasters were treated to five well-known speakers, prominent in broadcast.

Also, Gary Burbank, a 17-year veteran of "The Gary Burbank Show" and a self-made

Gary Burbank broadcast his show from the lobby.

comic legend, broadcast live from the hotel lobby using a Wheatstone console. Described as a cross between Gary Owens, Monty Python and Quasimodo, he has become something of a cult hero. He won the Marconi Award for radio personality of the year two years running and has received several other awards in the course of his career.

IBOC DAB

Glynn Walden, the director of engineering for CBS Radio Stations, gave a fantastic presentation on the shape of the IBOC AM and FM systems that Westinghouse Wireless Solutions is working on. As you know, Glynn Walden has been one of the anchors of the U.S. efforts to bring terrestrial DAB to both AM and FM broadcasters.

John Battison led off this year's nuts and bolts session with his topic on the "Digital Roadway." Battison is a consulting engineer, founder and first president of the Society of Broadcast Engineers. Joining Battison were John Delay, Don

Harris drew more than 300 to its Expo.

Markley, Marvin Born and **RW** *Workbench* columnist John Bisset.

TV too

As mentioned, this year's Expo was the first with emphasis on television technology, featuring several hours of information and education for television engineers. There were presentations on technical issues of ATSC startup, including scanning formats, compatibility during the transition years, standard definition vs. high definition, the multi-channel vs. single channel debate, and signal transport standards.

All in all, Harris did a great job pulling it all together, and the weather cooperated this year. (Last year, the Expo was held in December and it snowed pretty hard!).

And I wanted to extend a personal thanks to Gene Schulz, who (many of you may remember) retired a couple of years ago as the marketing manager at the then Harris Allied. Gene was kind enough to help find a reliable and honest mechanic to work on my car, which conveniently died as I pulled into town (not six blocks from the Leland). It turned out to be a dead alternator. Gene steered me in the right direction and I was able to get back on the road in time to come back here and write this column! Thanks again, Gene.

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GUEST COMMENTARY

There Was More to Operator Licensing

by Ken Blake

STOCKTON, Calif. An RW article by Troy Pennington (RW, June 11) outlined a less-than-complete version of the history of broadcast operator licensing. He volunteers a look at the "long" history of the SBE, beginning "way back" in 1977 at the time of its first certification test.

Pennington is either not aware of, or has not checked past licensing procedures of the FCC. His history of the genre merely begins with the testing format prevalent in the '50s, '60s and '70s, which consisted of multiple choice answers. A "first" was obtained by starting with a test for a minor license and working up through a series of additional license designations.

When taking the First Class exam, for example, if a portion was too difficult one had only to retake that section, not the complete exam. It wasn't necessary to be able to write; you simple chose answer A, B or C. I took the multiple-choice exam in Davenport, Iowa, in 1957 and passed it easily; the answers are on the page, in plain sight.

Trust but verify

Mr. Pennington apparently was dwelling on the FCC "relaxed" licensing period, when he stated that one need not have worked at a job requiring a license to obtain a renewal. The facts show that prior to that period, when a license was due for renewal, the operator had the service record verified by the immediate superior or station manager. A place for the record was printed on the back of each license.

I remember that when one was leaving an employer, especially if going to the competition, the employer would threaten not to sign the service record, thus assuming power to control the licensee's job potential. These retaliating actions occurred, but recent historians do not probe far enough in the past to catch the grim realities of broadcast technicians' problems in those uncertain times.

In 1935, I was employed as an announcer at a station in central Iowa. The engineer had an EE degree from Iowa State College. He designed and built the station transmitter and had tutored several license aspirants.

I engaged this man's services and, after weeks of concentrated study sessions, he felt that I was prepared to try for a "ticket." At that time there were no books describing the specifics of the exams that were not multiple choice, so one had to be well-prepared with complete and cogent answers.

The exam was the essay type, so my guru advised me to answer each question with a detailed delineation of all I knew on every subject. The FCC rules required a score of at least 75 to qualify for a license.

Depression era

During the Great Depression, an announcer's salary for a seven-day week and no vacations was $7. So, to get to the FCC test location, it was necessary to hitchhike to Kansas City and stay with family and friends while there.

Those who preceded me in the try for a license had plenty of advice for ensuring that the examiners would accept my paper. One said it was a requirement to diagram a complete broadcast transmitter using a ruler; neatness would result in a better grade.

Indeed, the diagram was a requirement and, in addition, one was asked to specify all parameters as well as the plate, filament and bias for each stage. As I laboriously diagrammed a 1 kW transmitter and made the lines just so, the inspector, strolling among the nervous test-takers, told me that it wasn't necessary to be that meticulous.

The exam began at 9 a.m. on a Thursday and recessed at 5 p.m. It reconvened at 9 a.m. on Friday and concluded Friday at noon. The testing began with a set of five questions to be answered in writing, followed by another set of questions, and so on until the test was concluded.

The examiners made sure you could not leave the examining room until you finished answering all the questions. After a day-and-a-half of concentrated pondering and writing, I finished the test and hitchhiked back to Iowa.

Special delivery

The following Tuesday my license arrived by mail. The First Class Radiotelephone Operator License was dated Oct. 8, 1935.

It is commendable that the SBE promotes a series of questionnaires to qualify certain individuals, but after more than 60 years of being 100 percent involved in all facets of the radio and TV business, one may feel that additional qualifying SBE adjudication is a bit redundant.

It is little wonder that the SBE is in a state of panic about those in the business whose "strength" lies in having passed the poorly constructed test with which Mr. Pennington is familiar. All of us should agree that an ominous day for former "First" ticket holders was the day we were forced to trade in our credentials for a "General Class License."

■■■

Ken Blake is a 62-year veteran of the radio industry. He is a broadcast consultant for Broadcast Electronics. RW welcomes other points of view.

All of us should agree that an ominous day for former 'First' ticket holders was the day we were forced to trade in our credentials for a 'General Class License.'

Three Percent and Holding

Minority ownership of radio stations is in a sorry state. There is little reason to believe, in this era of deregulation and consolidation, that the outlook will improve for blacks, Hispanics and other minorities.

The National Association of Black-Owned Broadcasters plans a lobbying campaign to reverse what it sees as a government retreat on affirmative action for broadcast ownership. NABOB has been trying to get the federal government to increase minority ownership programs for six years. "Most of our efforts have fallen on deaf ears, but we can't stop because of that," Executive Director Jim Winston said. "Political winds blow hot and cold. We're waiting for those winds to change, and in the interim, cause the winds to change."

NABOB chances with the post-Hundt FCC remain to be seen. The battle is likely to be uphill.

According to the Census Bureau, about 28 percent of the U.S. population are minorities. According to NABOB, blacks own only 1.7 percent of commercial broadcast stations; total minority ownership has been stuck at about 3 percent for six years. NABOB said minorities still lack access to capital, and also blames government actions to relax ownership caps and eliminate the minority tax certificate program, and a Supreme Court decision on government affirmative action programs.

A report from the National Telecommunications and Information Administration encouraged minorities to take advantage of two programs. RW has reported about one: the Telecommunications Development Fund. It plans to provide loans and capital to small communications businesses. The other is a management training seminar called "ComTrain," run by the NTIA Minority Telecommunications Development Program. The program, however, is tiny, able to help only a handful of qualified applicants each year.

We do not believe the government should mandate a certain level of broadcast ownership by any group or demographic. On the other hand, it's hard to believe that blacks, for example, who constitute a significant portion of our population, are well served by such poor representation in the ownership ranks. Does this serve the public interest?

— RW

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World Radio History

DAB Receiver Models Shown

BERLIN Digital audio broadcasting is not yet a reality in the United States. Abroad, however, DAB has reached sufficient mass to allow receiver makers to begin showing DAB radios.

The 1997 Internationale Funkausstellung (IFA) was billed as the official launch of DAB to consumers. Receiver manufacturers followed through. Some 15 companies, including leading names in the portable audio and auto electronics sectors, introduced consumer DAB receivers at this show in Germany.

What was left unsaid was when consumers could expect to see DAB receivers on store shelves or in car dashboards.

Multiple features

The receivers on display did combine a wide range of features, including RDS and PAD capabilities, as well as cassette and CD options.

U.S.-based Delco, for example, showed the prototype DAB 100 automobile receiver. According to the company, the unit will receive all the frequency bands planned for use in Europe and Canada, will decode the complete Eureka-147 ensemble and will harmonize RDS and DAB functions.

In addition, the Delco DAB 100 is designed to switch automatically between FM and DAB signals for the best possible reception. However, this feature is not yet supported by broadcasters.

Philips Car Systems exhibited its new DAB receiver. A small, trunk-mounted tuner box is required for the system, but, according to the company, a single in-dash tuner unit is planned for the year 2000.

The Philips tuner receives both VHF band III and L-band DAB broadcasts. It can also display program-associated data (PAD) on a two-line, 16-character LCD display. Philips is prepared to add additional multimedia capabilities to the receiver, once standards are set.

Scheduled to be on the market in 1998, one of Philips' main goals is to convince automobile manufacturers to include the new receiver in their cars.

To help sell the product, Philips will emphasize value-added services such as GSM and navigation systems, said Frans Westra, senior product manager for Philips Car Systems.

Three front-ends

Blaupunkt displayed its DAB receiver box, which can be combined with one of three different DAB car radio front ends: the Stockholm RCM 128, Sydney RCM 128 cassette radios and the Toronto RDM 128 CD tuner.

Pioneer plans to launch a DAB tuner module for Intelligent Pionner (IP) bus systems in spring 1998. The compact DAB tuner module can be controlled by any IP-bus in-dash unit with RDS, avoiding the need to replace the complete sound system.

"We are targeting innovators, those who are willing to spend a little extra for superior quality," said Geert Verhoeven of the product planning department, car electronics division for Pioneer.

The DAB 9475 digital and FM receiver was the new Clarion entry. The car audio receiver, which fits into a standard mounting frame, features a high resolution dot-matrix display and a connector for an external data service decoder.

Available in 1998, the tuner requires no receiver box in the trunk and is easy to install and use. The DAB 9475 system also permits selection of preferred program types (PTY) and is equipped with a PTY search function.

The Kenwood KRC-358 DAB head unit can receive DAB signals, as well as FM, AM and longwave broadcasts. The head unit also features, RDS, CD control and a compact, theft-deterrent faceplate (TDF).

The KRC-358 works with a DAB antenna and tuner that can be installed in a car trunk or under the driver's seat. The system is will be available sometime in 1998.

Also on show was the Panasonic mobile receiver test unit, which is currently in use in a DAB pilot project in collaboration with Deutsche Telekom in the German state of Hessen.

Due to be on the market in 1998, the receiver will support both DAB and FM programs and will feature automatic tuning.

Prototype tuner

The Panasonic Technics had a prototype tuner on display, but is scheduled to have a production model ready by summertime. The prototype supported audio bitrates from 32 kbps to 384 kbps (ISO/MPEG Layer II) and VHF band III broadcasts, as well as data services.

JVC also showed a trunk-mount DAB receiver unit. The prototype front-end system includes a two-line, 16-character display and is capable of receiving AM, FM and DAB programs.

Robert Bosch Multimedia-Systeme presented the DAB MOS module, which is based on the Bosch D-FIRE (DAB fully integrated receiver engine) chip concept, which allows manufacturers to implement DAB features in DAB/FM automobile radios, DAB PC cards and portable DAB radios.

Bosch also showed the Hannover 106 receiver, which can be integrated with a decoder and a 4-inch or 5-inch color display for additional data display.

Grundig showed its DCR 1000 DAB receiver, along with two new data terminals — the DAB-T 1002, with a color display and the DAT-T 1001, with a removable monochrome display.

The DAB-T 1002 data terminal makes it possible to display data broadcasting services independent of the program. Therefore, color images such as weather and traffic maps can be displayed in a JPEG format while comprehensive texts could be reproduced in HTML, the computer programming language used to create World Wide Web pages.

Home gear

And Sony presented the new XES in-car entertainment system, which is expected to be launched on the European market in the spring of 1998. The XES was designed to allow for full compatibility with DAB.

Other DAB receivers on display at IFA included the Alpine Electronics DAB Autoradio and a Fujitsu DAB receiver, expected to be available on the market in spring 1998.

Roke Manor highlighted its Gold Pack DAB development kit, which includes a passive antenna for both L-band and VHF band III DAB.

In-home units being exhibited included the Sharp MD-X8H MiniDisc stereo system, which featured an integrated DAB tuner. According to the company, the MD-X8H is compatible with all current digital audio signals, such as those found in CDs, DAT-recorders, DAB and the Internet.

Bang & Olufsen displayed its DAB test receiver for the home. The company has delivered 500 DAB test receivers with advanced display and user interface features for pilot tests being conducted with Danmarks Radio.

Although the focus of IFA is on consumer electronics, a few DAB transmission manufacturers were also present.

Rohde & Schwarz introduced a service transport interface (STI) for the DM001 DAB Multiplexer. STI, which in the future will be known as ETS 300797, has been developed within the framework of Eureka 147. According to Rohde & Schwarz, STI can be used to transport service provider contributions to an ensemble multiplexer or to a higher-order service multiplexer.

Italian transmitter manufacturer CTE was also present at IFA with its new line of DAB products, including DAB transmitters for both VHF band III and L band.

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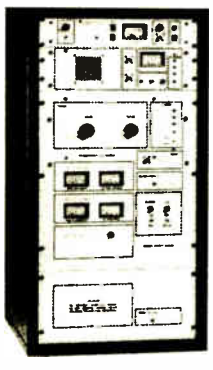

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DAB Radios Roll Out

▶ DAB, continued from page 1

Other features of interest to listeners were information services and news data. Business people and other special interest groups were interested in receiving DAB services on a computer via a PC plug-in-card.

More information please

But despite Witherow's contention that "We are now entering the third age of broadcasting — the digital age," not everyone is convinced that DAB will be as successful as its proponents hope.

According to Thomas Rohde of Fujitsu Ten Europe, one of the manufacturers with a DAB receiver on display at IFA, a major concern is consumer information.

Although manufacturers were quick to point to an initial positive response from the public at the show, some remarked that consumers are not well informed about DAB.

"I am not convinced that DAB will be a success," said Ingo Wagner, marketing planning manager for Alpine Electronics, which also showed a new DAB receiver. "It is a question of customer acceptance; they are not asking the consumers what they want."

Rohde said many consumers are not familiar with the latest radio technologies. He said this makes it almost impossible to sell such products.

"We need to find an easy way to market and explain the product so that the consumer is not intimidated and seeks more information," Rohde said.

World Radio History

Mileage Standard Debated

▶ MAIN, continued from page 1

reasonable to listeners, not just to advertisers or licensees themselves."

These groups supported the mileage standard only if it was set at 25 miles.

Morality in Media also opposed the 50-mile mileage standard.

Most broadcasters supported keeping the public file at its main studio, "wherever that is because that's where the listeners come," wrote a commenter who said she had managed or owned stations for 50 years.

Public file records

Several commenters objected to the proposal to require stations to keep e-mail messages in their public file. "(The proposal) would effectively compel a station to monitor all of its staff e-mail accounts as well as increase the risk of harassing or frivolous e-mail jamming a station public file," wrote Odyssey Communications. Even if only certain e-mail messages had to be kept, continued Odyssey, "a cautious station may feel compelled not to dispose of any of the e-mail it receives, in order not to risk the possibility of sanction because of the actions of one careless or confused employee, who deletes a message by mistake or because he or she believes it is not necessary to save (it)."

The North Carolina and Virginia Association of Broadcasters noted that keeping e-mails would be "time-consuming and costly." They opposed mandating that stations have to sort, prioritize and keep e-mails in the public file.

Noting that broadcasters can't have it both ways, opponents said e-mails are just as valid as regular printed messages.

Broadcasters supported reducing the number of documents necessary to be kept in the public file (not having to replace documents left out by a previous owner), and reducing how long they should be kept.

Opponents resisted any relaxation. "Since broadcasting is increasingly dominated by ever larger group owners with stations changing hands quickly, relaxing this requirement would enable group owners to evade detection of violations of the FCC multiple ownership, programming and EEO rules."

Claiming that "broadcasters have wildly exaggerated the costs" of maintaining ownership documents such as articles of incorporation, bylaws, loans and management information, opponents urged they be maintained. "These documents are often the only evidence the public has to determine questions of whether a party has an attributable interest in a station, or whether there is another real party in control."

Black Radio Ownership Declines

by Leslie Stimson

WASHINGTON The government has retreated from affirmative action for broadcast ownership, in the opinion of the National Association of Black-Owned Broadcasters, and NABOB wants to turn that around.

The group is planning an aggressive campaign of lobbying the FCC, Congress and the Clinton Administration. "While no none has suggested minority (broadcast) ownership is no longer a needed public policy," NABOB Executive Director Jim Winston said, "we see a retreat from fostering minority ownership."

Winston cited a survey by the Commerce Department's National Telecommunications & Information Administration that showed minority ownership of radio and TV stations remained about 3 percent for the sixth year in a row.

"Our research indicates that minorities still lack access to the capital necessary to develop broadcast businesses," the report stated.

Minorities owned 322 of 11,475 commercial broadcast stations, representing 2.8 percent of commercial ownership, down from 3 percent in 1996, according to the report.

Of this total, black ownership represents 1.7 percent, Hispanic ownership represents 1.05 percent, Asian ownership represents .03 percent and Native American ownership .04 percent.

Black ownership dropped from 1996 by 30 stations, to 165 radio and 28 TV. The decline was due, in part, to the sale of U.S. Radio, the largest black-owned broadcast company, to Clear Channel Communications.

Also cited for the drop in minority ownership was the federal government actions to relax station ownership caps and eliminate the minority tax certificate program in 1995, and the Supreme Court decision that year that applied a stricter standard for government affirmative action programs.

The FCC has been studying a mechanism to increase minority ownership; that research is continuing.

Minorities can take advantage of the Telecommunications Development Fund, designed to overcome minorities' traditional lack of access to capital. The fund is expected to be operating by January.

World Radio History

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Kuralt's Station on the Block

by Sharon Rae

ELY, Minn. Some refer to it as a cross between "Northern Exposure" and "A Prairie Home Companion." Whatever you call it, this tiny radio station 260 miles north of Minneapolis is finding itself in a tight spot with the death of Charles Kuralt. The retired CBS news reporter rescued the business from bankruptcy two years ago.

Charles Kuralt

"How many other stations can boast a listening audience of hundreds of moose, North America's largest population of timber wolves — and a heck of a lot of hearty Iron Rangers to boot?" asked WELY's web page.

WELY-AM-FM, on the border of the Boundary Waters wilderness, touts itself as "end of the road" radio. Unfortunately, this catchy nickname may be a sign of things to come.

"We cannot afford to buy the station," said Mike Hillman, now co-general manager with his wife Julie, whom he called the "brains of the operation."

"I'm just another pretty face," he said with a laugh.

Kuralt purchased WELY in May, 1995, about a year after tuning in to one of Hillman's Sunday morning shows.

"At the end of my shift the phone rang and it was Charles Kuralt," said Hillman. "He was up doing research on Ely for his 'Charles Kuralt's America' book, and he said, 'Mr. Hillman, you sound like you know a lot about Ely. I haven't enjoyed a Sunday morning radio program like yours for years.'"

Hillman, a northern Minnesota historian, remembered the call as one of the thrills of his life.

"I can still vividly remember hearing that beautiful baritone voice on the other end of the phone line," he said. "We set a time to talk and got together for blueberry pie and coffee ... one of the things Charles said to us was, if there was anything he could ever do to help us or the station, to call."

Julie Hillman took Kuralt up on his offer when the owners of WELY were forced into receivership in April of 1995. The station was dark when Kuralt bought it.

"He told us if both of us were willing to run (the station) for an absentee owner, he would buy it," she said. "On May 31, 1995, the court put their stamp of approval on his purchase ... beginning Boundary Waters Broadcasters Inc."

The new WELY began broadcasting on July 1, 1995 (Canada's national holiday), with a total of 32 classical CD's and Mike Hillman's personal rendition of "O Canada" to honor "all of our maybe six Canadian listeners."

"The day before we went on the air ... we went to Duluth with a thousand dollars and bought some music," said Julie Hillman. "We did not have an enormous budget so one of the first things I did was to contact the National Association of Independent Labels, which opened to the door to free music.

"The only direction we ever received from Charles was: 'A radio station without a heart and soul is nothing but a box of wires, so no satellite feeds! Everything must be locally produced. I want the talk to be about Ely and the wilderness area.'"

WELY's programming ranges from folk, Celtic, new age, rock, and blues to jazz, Cajun, country and classical.

"Our motto is, 'If it sounds good, it is good, so play it!'" Julie Hillman said.

Photo by Sharon Rae

Mike and Julie Hillman

"We don't have a program director," explained Mike Hillman. "We play everything from the Grateful Dead to a four-hour polka show on Saturday mornings. The host, Don Micklich, does the weather reports in Finnish and starts out every show with, 'Hello polka pals and polka gals and all the little polka dots, this is Polka Pal Don.'"

The Hillmans decided to drop ABC's Paul Harvey when Kuralt came on board.

"It really didn't matter to Charles what (network) affiliation we had," said Mike Hillman. "But I said, 'For heaven's sake, Charles, you worked for CBS for 37 years.'"

According to Hillman, while the Paul Harvey switch was "traumatic" for listeners, it was the right thing to do.

"The last conversation I had with Charles was June 11th, 1997," said Julie Hillman. "I knew he was dying. The last thing he said to me was that he had to buy the tower for WELY. It's the last thing he had to do. We had been leasing space on the tower."

On June 12, Kuralt bought the tower. On July 4, he died.

"We are looking for a buyer that will honor Mr. Kuralt's vision of the integrity of journalism and broadcasting, and honor the fact that he thought my wife and I were the people that should be doing this," said Mike Hillman. "And while I may not be able to say I'm in a winning situation, I can't lose because we've done well here. We've tripled the best year that the old station ever had and that was in our second year."

"There are various interested parties that we have been talking to about the sale of the station," said Julie Hillman. The asking price for the station, including the tower, is $500,000.

NPR Heads for Borders In Public Awareness Bid

by S. D. Yana Davis

WASHINGTON NPR and Borders Books & Music inked deals to exploit their commonalities and superserve their shared audiences.

"The psychographic profile of the NPR core listener and the Borders shopper are the same. Basically, it is the same person," said Rob McKnight, NPR national representative for corporate marketing. Which makes the parallel deals NPR and Borders have concluded perfect sense from both company perspectives.

McKnight initiated an agreement whereby Borders became one of the biggest underwriters of NPR last June. Borders is sponsoring "Weekend Edition Saturday with Scott Simon," "Car Talk," "Performance Today" and "Talk of the Nation."

McKnight said he began discussions about program sponsorship with Borders in January 1996. A year ago, Borders management indicated they wanted to have an in-store presence for NPR as well. At that point, McKnight called in the NPR entrepreneurial division.

'Town Square'

Borders then developed an "NPR Town Square" kiosk, rolled out at a D.C.-area Borders stores on Sept. 30.

The kiosks, which will be part of all 180 Borders stores by the end of October, allow the giant bookseller to cater to book-hungry NPR listeners by stocking authors and titles recently heard or reviewed on NPR programs. Such reviews and interviews are a staple of many NPR programs, including NPR news magazines "Fresh Air" and "Talk of the Nation."

"We constantly have customers coming in and saying, 'I was listening to NPR the other day and they were talking about this book,'" said Judy Kohn, director of public relations at Borders. This experience helped prompt Borders to develop the kiosk concept, as well as the plan to instantly gratify NPR listeners in search of the books mentioned on-air. Kohn says that Borders will restock the kiosks daily based on NPR-provided rundowns of the programs, so that books reviewed or the subject of author interviews will be available no later than 48 hours after broadcasts.

Additionally, the kiosks will feature CDs reviewed or played on NPR programs, and a limited number of NPR-branded products, such as "Performance Today" classical discs.

Is it legal?

Because NPR is a non-profit corporation, how can they legally provide NPR-branded products for sale on the Borders kiosks?

"Non-profits can raise a certain amount of 'UBI,' unrelated business income, legally," said Carol LeBlanc, head of NPR's entrepreneurial division. "We track it separately from other sources of income. If it became large enough, we'd have to spin that off into a separate entity, but we are nowhere near doing that now."

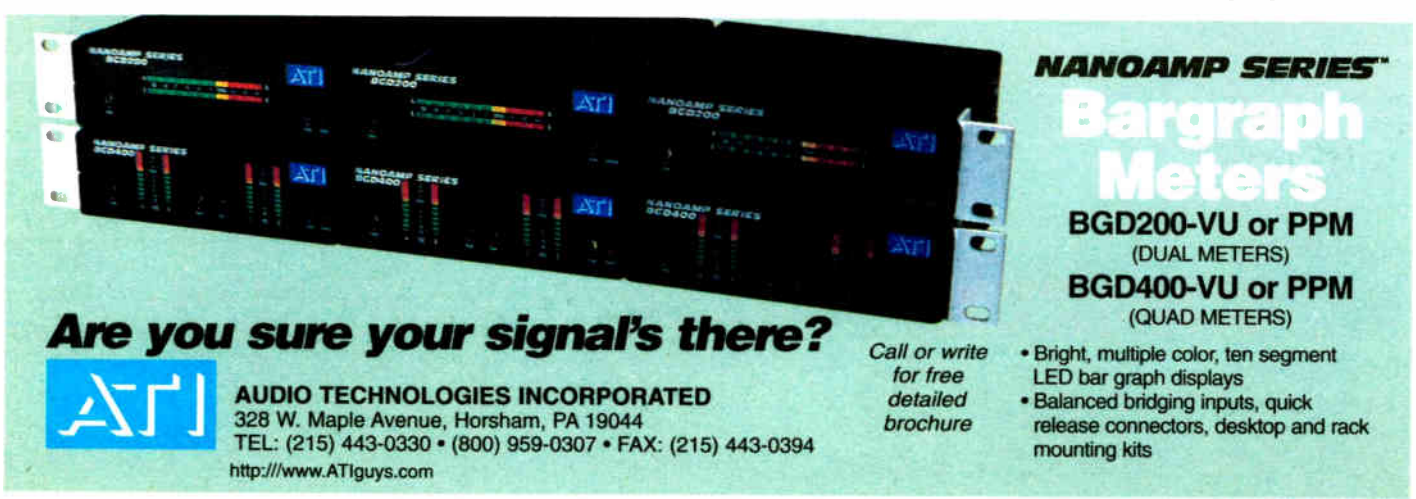
Should commercial radio stations be concerned about the NPR/Borders deals?

"Books whose authors are heard on commercial stations are already featured at Borders," LeBlanc responded. "Our kiosks will feature books by authors reviewed or interviewed on NPR, sales of which don't provide NPR with any financial benefit."

McKnight said Borders already has substantial advertising in other media, and that its efforts to sponsor NPR programs and develop the in-store kiosks came from understanding the profiles of its customers and how this matches its audience.

Audience studies indicate that as many as three-fifths of NPR listeners buy and read books regularly, far exceeding other broadcast media.

Both the underwriting sponsorship and in-store kiosk arrangements between NPR and Borders will run for three years.



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World Radio History

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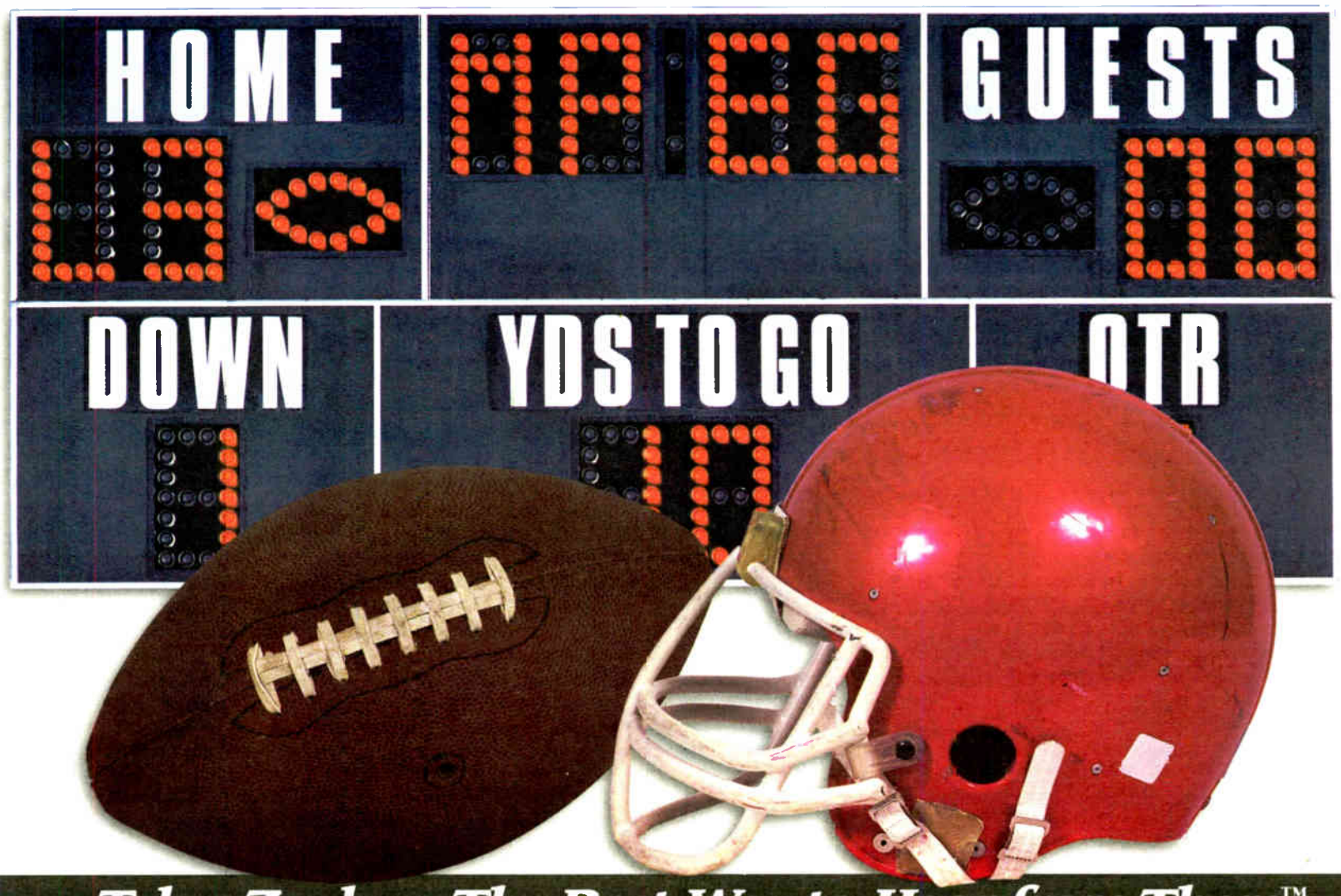

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World Radio History

Audience 98 Peers Into Future

by S. D. Yana Davis

WASHINGTON Commercial radio always is searching for ways to attract the advertisers. For public radio, however, each listener plays the role of the ad agency or business.

Public stations want ratings information translated into "information that a public broadcaster can use." Audience research needs to find the relationships between programming, listening habits and individual contributions to public stations.

Enter Audience 98, a system-wide study of public radio listeners who kept ratings diaries during the Arbitron survey in the fall of 1996. Of approximately 33,000 listeners nationally who reported a public station in their diaries, about 15,000 were recontacted and asked a series of questions to determine more than 200 characteristics. Better than half — about 8,000 — responded.

Arbitron administered the mail survey; the ratings firm does not release information about diary keepers. The survey questionnaire was designed by public radio audience researcher David Giovannoni along with Thomas J. Thomas and Theresa R. Clifford of Thomas & Clifford, and George Bailey of Walrus Research, with extensive consultation of the public radio system.

The study was funded in part by the Corporation for Public Broadcasting, but also by 91 "piggyback stations" that paid for individual Audience 98 analyses of their own listeners. The nationwide survey was done without reference to individual stations, using the scientific random-selection method to get a statistically valid cross-section.

Findings of Audience 98 won't be known in full until a number of interpretive reports are written over the next two years. But the study promises to be valuable to public radio station managers, programmers and fund raisers.

Besides providing a socio-economic picture of listeners, Audience 98 profiles public radio audience members in ways uniquely interesting to non-commercial broadcasters. The data can provide not only listening information but also listeners' perceptions of the station, the value they attach to network and local programming, and their motivation for giving money, or not giving it, when stations make their fund-raising appeals.

Detailed info

Roger Johnson, program director at KPLU(FM), Seattle, said that while Audience 98 so far offers few surprises for programmers, the information is valuable.

Johnson said KPLU depends on listeners for "about 60 percent" of its budget, making the study an invaluable tool in fine-tuning programming and on-air fund raising.

"The survey found out a lot about listeners' lifestyles and values, and asked specific questions about their use of public radio and whether they are members (contributors) and why or why not," said John Berky, vice president at Connecticut Public Television and Radio. "This allows us to segment givers vs. non-givers, to find out what (programming and fundraising techniques) appeals to people who subscribe."

"We're seeing some things we can fine-tune," Berky said. "Particularly during our fund drives — what is it that we're saying to listeners, the approach we take in discussing funding issues on the air, how to hit the hot buttons to encourage listeners to call in and pledge support."

Berky said of Bailey's "Program Economics Report," taken from Audience 98 raw data: "It shows you which programs are actually bringing the money in. Sometimes we get caught and put our money in programs that don't pay us back."

What works?

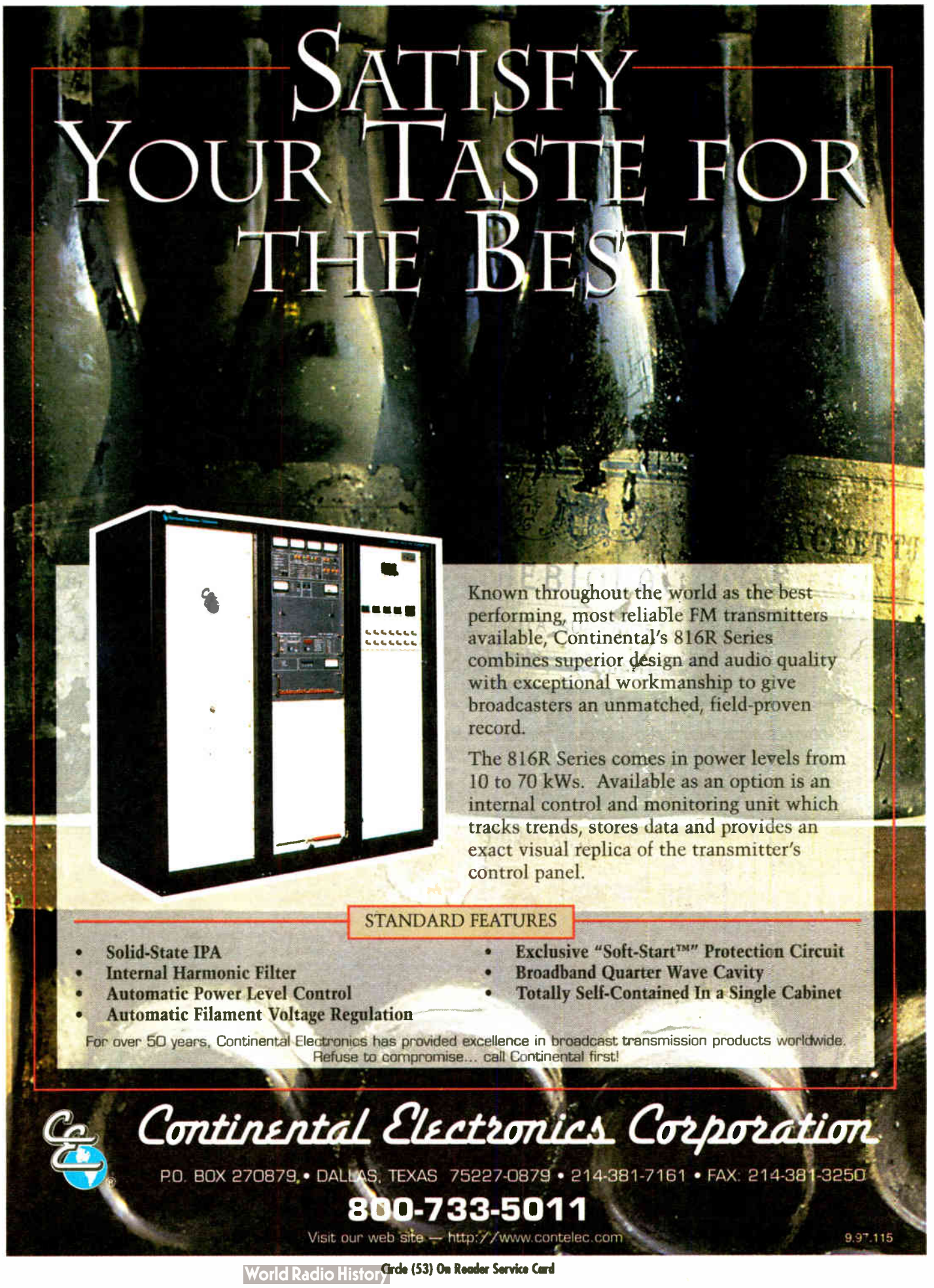
In the past, public radio programmers assumed that listeners called to contribute during fund drives when their favorite programs were on the air. But, Berky said, audience analysis provided principally by Giovannoni and a handful of others shows that listeners typically call "when it's convenient, when they're near a phone."

Many stations find that NPR's flagship daily news magazines, "Morning Edition" and "All Things Considered," are the programs that motivate most listener contributions during fund drives.

The survey also supported one of the most basic characteristics of the typical public radio listener. "Education is the distinguishing characteristic of a public radio listener, not income," Giovannoni said. "Who are the most educated people in our nation's history? Baby-boomers."

And while baby-boomers represent a significant pool of disposable personal income, public radio tends to attract the better educated, regardless of economic group. Other characteristics of public radio listeners will be analyzed and cross-referenced as the reports based on Audience 98 continue to be written over the next two years.

David Giovannoni



Circle (53) On Reader Service Card

World Radio History

Studio Sessions

Radio World — Resource for Radio Production and Recording — November 12, 1997

Product Wrap-up
See Page 21

East-West Revives Sampling Fun

Alan R. Peterson

East-West is one of those companies you wish you knew about last month when you really needed some strange and unusual music or effect for a piece of production. East-West is not a production music company or a jingle house, but this California-based division of East-West Communications is a distributor of sampled sounds on CD and CD-ROM.

Only a few years ago, samplers were in vogue in radio production rooms for the classic electronic stutter effect. But with Max Headroom now dead and buried, the once-mighty keyboard now sits idly in the corner of the studio, lonely and neglected.

To many production people, sampling has somehow become the ugly cousin of audio-for-radio, the "easy way out," I have heard. Grab some music, truncate it, loop it and you have an instant production music bed; who can't do that? Where is the creativity?

Some producers turn up their noses, claiming current uses such as Puff Daddy's looping of "Every Breath You Take" by The Police to be mere laziness. Whatever your feelings about sampling, East-West has made an industry out of it. Selections offered in the catalog were created for the sole purpose of grabbing and using in other compositions. These may inspire you to new heights of sound manipulation and may help you rediscover what a hoot it is to use the sampler.

And if you are one who feels slighted by Puff Daddy's success, all I can suggest is that you don't sample The Police.

Great titles

It is hard to dislike a catalog filled with titles such as "Smoov Grooves," "Kritical Massive," "Diffusion of Useful Noise" and — dare I say it — "Funky Ass Loops." Each disc is filled with dozens of drum beds, electronic effects, wild and interesting processed sounds and vocal effects. By no means is this the limit of the CD selections offered by East-West, and there are plenty of strange elements available for whatever work you need to do.

If you are a sampling novice, it is well worth your time to dump several samples into your keyboard and try your hand at dance and hip-hop production. Before you scoff at this, remember: Men and women who have shown they can do this well are driving around in limousines right now. The worst that can happen is that you become absolutely brilliant and hire your own driver.

East-West recently began placing samples on the World Wide Web to download and try out. It does cost a certain amount per sample, but you select only what you want and not pay for a disc filled with material you would not use. Check availability and price at *www.eastwestsounds.com*

East-West sent **RW** two CDs for review: "Symphonic Adventures" and "F.A.S.T. Animation." One is a collection of symphonic passages, the other a series of electronic effects, produced in Germany and heavily processed using Roland Sound Space technology.

The crippling limitation on "Symphonic Adventures" is that samples are licensed for music production only. Nowhere in the copyright notice is there a grant for radio broadcast-specific use.

I suppose it may be possible to cobble up a music bed of some sort, then fly in a sample from "Symphonic Adventures," call the entire thing "My Music, Part One," then go ahead and use it behind a spot while crediting your sample source. Just be aware that the composer and performers have rights to their performances, so don't do anything that may get you in trouble (such as claiming the sample as your own work).

That aside, this CD is filled with those little orchestral tidbits you have always wished you had. There are musical cues that sound as if they belong in movie soundtracks, TV "medical" shows and larger symphonic movements. This sample CD evokes many moods, including tension, suspense and the classic "chase."

Note these are not full orchestral pieces, but rather a number of short selections that you would normally hear punctuating dramatic moments in movies. Use them as just that: punctuators. Remember, the initial purpose of this CD was as a sample source of

See SAMPLING, page 14 ▶

DIGITAL DOMAIN

Technical Considerations Of DVD

Mel Lambert

A little over a year ago, I spotlighted several multi-channel audio applications for DVD, the much-vaunted consumer video playback format that has been attracting a great deal of press during recent months. Hopefully this format can be made easily record-capable before too long.

Aside from what I consider to be a questionable decision to utilize conflicting data compression techniques for Europe and North America/Japan — MPEG for PAL-compatible markets and Dolby Digital for NTSC-based territories — in addition to region-specific software to help control the staggered release of different titles throughout the world, it would seem as if DVD is here to stay.

This is not to say that it has been an easy birth. I am reliably informed that the initial rollout of DVD in selected test U.S. markets was less than stellar compared to its predicted reaction.

Heavyweights throughout the film community, whose approval was essential for the format to secure sufficient offerings and ensure favorable public reaction, were ready to bail during early months.

How about audio?

Video technologies aside, there are a number of audio and related data-storage applications for Digital Versatile Disk, possibly utilizing dual-density encoding for the double-sided format.

See DVD, page 13 ▶

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Circle (30) On Reader Service Card

World Radio History

▶ DVD, continued from page 12

The main attraction for DVD in a number of peripheral but related markets, is its truly staggering storage capacity: up to 17 GB.

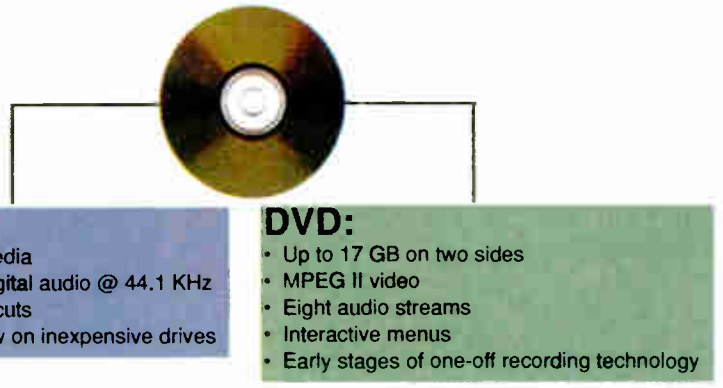
DVD-Video's specification includes variable bit-rate MPEG-2 video, eight streams of data-compressed or PCM audio, 32 subtitle streams, interactive menus, plus other user-friendly features. For the benefit of the technically curious, the higher data-packing density stems from the use of smaller pit dimensions than those found on conventional audio CDs, courtesy of a red-reading laser that incorporates a shorter optical wavelength.

Also for the technically inquisitive, the development of a DVD recorder is not a trivial matter. Recall that, like CDs, DVD playback media are currently manufactured utilizing high-capacity techniques from a glass stamper that is produced at relatively high cost.

Obviously, economy of scale dictates that we need to commit to a reasonable number of copies once the DVD "presses" have been activated. New generations of blue lasers are being developed to accommodate the short wavelengths of light, necessary to form the erasable pits within the DVD's substrate layer, much like today's generation of magneto-optical drives, but with phenomenally higher resolution.

By the way, we are talking about at least an order of magnitude or more of difference in the packing density, track and inter-track dimensions between MO and DVD technologies.

Currently, DVD recorder manufacturers have moved towards green and yellow lasers, which reportedly provide reasonable results with 4.7 GB formats. Versions of the powerful blue-format read/write laser assemblies are still in the prototype stages.



It is not just the audio and computer industry that is looking for such advances. Originally, DVD was heralded as the ultimate random-access, multi-channel replacement for consumer VHS videocassette recorders. However, without the ability to time-shift football games or soap operas, it would appear that the Mr. and Mrs. America are willing to hold onto those VHS decks for just a while longer. But, to be realistic, the consumer and professional-audio markets for DVD and its emergent manifestations are just a drop in the bucket compared to computer applications.

And where there is a computer, there could be a digital audio workstation.

Initial DVD-Video releases hold at least 4.7 GB of data, using one side and one layer of the format's dual-sided/dual-layered capability, and provide 133 minutes of movies

See DVD, page 19 ▶

The movement towards authoring DVD has already begun in earnest. In addition to Pioneer's announcement of the DVR-S101, Sonic Solutions recently unveiled its SonicStudio DVD.

Heralded as the industry's first pre-mastering workstation for DVD-based audio, SonicStudio DVD is capable of authoring current-generation DVD-Video and will provide content for the upcoming DVD-Audio specification.

The Mac-based/hardware features capture, editing and double-precision processing of 24-bit, 96 kHz multitrack audio.

A specialized tool set, which includes double-precision NoNOISE and extended frequency-range filters with 48-bit processing for ultra-low distortion, is integrated with Sonic's new authoring software, Sonic DVD Producer.

The authoring and formatting system takes title development from the initial design stages of a project to the final disc image, with real-time preview at every step.

Audio can be formatted into PCM elementary streams, Dolby Digital, MPEG-2 surround or other popular DVD-related formats. SonicStudio DVD includes integrated project planning assistants, a storyboard editor and layout editor, Bit Budget management and direct integration with video and audio capture and formatting tools. It also features real-time assembly and playback of DVD titles throughout the authoring process. An integrated on-screen remote control allows DVD titles to be interactively previewed the same way as the finished disc would be played on a consumer player.

For more information, contact: Sonic Solutions, 101 Rowland Way, Novato, CA 94945; (415) 893-8000. Visit the Sonic Solutions Website at *http://www.sonic.com* or *circle Reader Service 132.*

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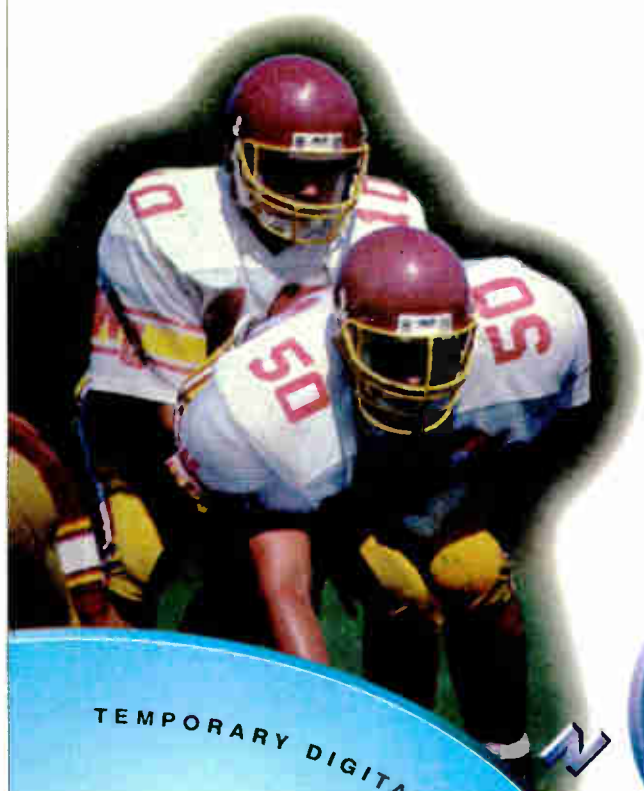

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World Radio History

Casting CDs in the Sonic Foundry

Carl Lindemann

Until recently, recordable CDs had limited utility. Professional recording studios used them to produce glass masters for replicators to mass-produce standard audio discs.

CD-R is now crossing over into wider use propelled by two factors. First, prices have dropped dramatically. In 1988, a basic 1x recorder cost more than $40,000. Six years later in 1994, faster units were in the $4,000-plus range.

Today, a mere three years later, prices of internal-mount CD-R recorders are one-tenth of that.

Second, and equally important, is the availability of software that extends the flexibility and function of CD-R units. Today, most recorders come bundled with easy-to-use packages that meet consumer demand for basic data archiving and audio mastering.

Now, the Sonic Foundry CD Architect fills the gap between pro audio and consumer products with significant applications in radio production.

Inside the box

CD Architect comes bundled with the excellent Sound Forge XP package from Sonic Foundry and runs under Windows 95 or NT. It can be used as a plug-in to Sound Forge 4.0 or as a standalone in tandem with XP.

For Sound Forge users, the layout and feel of the CD Architect interface is familiar, with shared features like the Wave Display, Time Ruler, and Zoom Controls. And for those having their first experience with Sonic Foundry products, it is easy to find your way around.

The manual is well-written and accessible, and the "Quick Start" section is just right for those who prefer not to go by-the-book.

With a very few rudimentary details, the basics became second nature; I figured out the core operation — selecting WAV files for a CD project — immediately. In moments, I was successfully burning my first CD-R. Developing skills with more advanced features — most importantly, PQ editing, came quickly.

While more involved than consumer-oriented products, this does not require a major investment in training. The CD Architect pro audio origins give it features specific to those applications with cross-overs into radio production.

Musical roots

Monty Schmidt, Sonic Foundry president, began developing CD Architect for friends in a local band.

"They had a DAT of a live performance, and wanted to make a CD from it," said Schmidt. "I checked out the software on the market, but it wasn't very useful."

The problem with consumer-oriented products was inflexibility. These products could only place a preset two-second gap between cuts. Professional products that could craft natural sounding segues (applause and/or fades that would connect tracks) were cumbersome and complicated.

During the following year, Schmidt worked with a local recording studio, mastering client projects to CD for free. The payoff was being able to develop a product with a hands-on end-user perspective, albeit a pro audio one.

Given these roots, some capabilities may seem like overkill. Already, the latest consumer software bundled with recorders can handle the bulk of radio station needs. Where does CD Architect fit in?

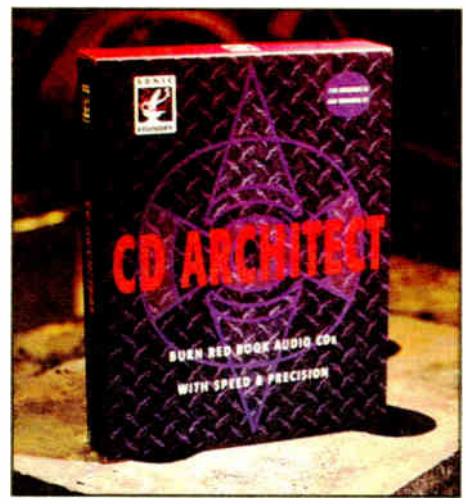
The niche

Most consumer packages are geared toward "track at once" audio or "packet" data recording. These are fine for most quick-and-dirty work.

CD Architect, on the other hand, carries out "disc-at-once" recording that generates fully Red Book-compliant discs. Disc-at-once burns information onto CDs in a one-time only process.

For radio stations, this is particularly suited to creating high-quality client presentations or to making masters of archival material. If you have tape reels full of sweepers and station IDs, or vinyl libraries of production music and sound effects, this is the way to go.

How CD Architect comes into its own here is in the quality and efficiency it brings to this task. With most consumer CD mastering software, audio regions, sound files and CD tracks are treated as one and the same.



This makes these packages easy to use. However, when re-mastering archival material, it becomes an annoying and time-consuming oversimplification.

The practical problems become obvious as you digitize material on a DAW. Each track must be recorded as an individual sound file or they cannot be assigned an individual track on CD. With the project splintered into separate sound files, each has to be re-mastered individually to maintain consistency in balance, volume and mix.

Worse, this piecemeal approach offers no easy way to get a project overview. For that, you must burn it to disc and have a listen.

But audio regions, sound files and CD tracks are distinct. CD Architect can treat them as such and manipulate them independently.

See CDR, page 19 ▶

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Useful Sampled Sounds

▶ SAMPLING, continued from page 12

symphonic material for contemporary music production, so the cuts are going to be deliberately short.

The CD is credited to "A very talented American composer" and "One of the outstanding European symphonic orchestras," so you never really know who is on this disc. I found it useful, although it took me a while to find a project to use it on.

Bloop-bleep

"F.A.S.T. Animation" was at the other end of the rack, so to speak. Nearly all of the effects on this disc are electronic and analog, and the spatial enhancement used on the cuts causes each effect to fly around, within and beyond L/R space.

This is not always a desirable thing; more than once I wished for a sample to hold still in mono space to make it useable. If you are after a CD filled with bursts, stingers and flybys for radio promo production, look elsewhere.

This CD is filled with only the building blocks that go into creating those production elements, so you can use this disc to "roll your own" if you are so inclined.

The CD is copyrighted in 1996, but some effects may suggest the early '80s to you. As a collection of bloops and bleeps, it is probably better suited for music construction than for whatever radio purposes you might have considered.

If I had to select a couple of East-West discs to claim as inspiring sources, I might suggest "Hot and Sweaty House Cuts," "Voice Spectral" and all three discs in the "Poke in the Ear with a Sharp Stick" series.

"Hot and Sweaty" is a collection of rhythm loops and musical stabs. Assemble these in a sampler, poke a few keys and you are creating your own music beds. Don't feel guilty; after all, that is why this CD was made in the first place.

"Voice Spectral" has 1,000 vocal samples with vocoding, computer generation and resynthesis. Drop a few into your machine, reverse some and add elaborate filtering to the rest. This is one disc that you will find a use for right out of the mailer.

"Poke in the Ear" defies description, with titles such as "Tiny Robot Hairball," "Fried Tooth Fairy" and "Alien Sinus Problem." This one you will just have to hear to appreciate.

The pressure is on the production director every day to be twice as brilliant as he or she was yesterday. Sample CDs are versatile sources of raw sounds and unusual textures that may inspire a producer to levels of creativity beyond cliché "door knock" and "telephone voice" spots. They also inspire the idea of "gluing" two or more separate samples together in a rhythmic manner just to see what the outcome will be like.

A good place to begin breaking out of the mold may be with the East-West catalog.

■■■

East-West is at 345 N. Maple Dr., Beverly Hills, Calif. 90210. For information and a catalog, call East-West at (310) 858-8797 or circle ***Reader Service 145.***

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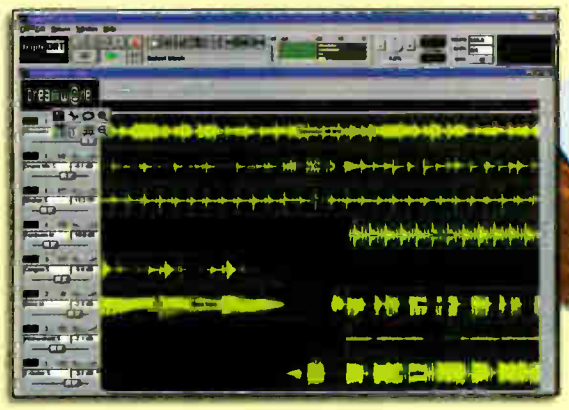

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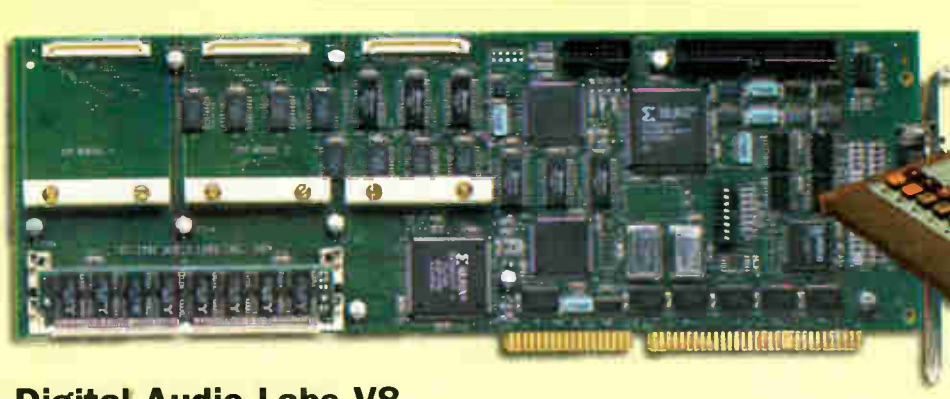

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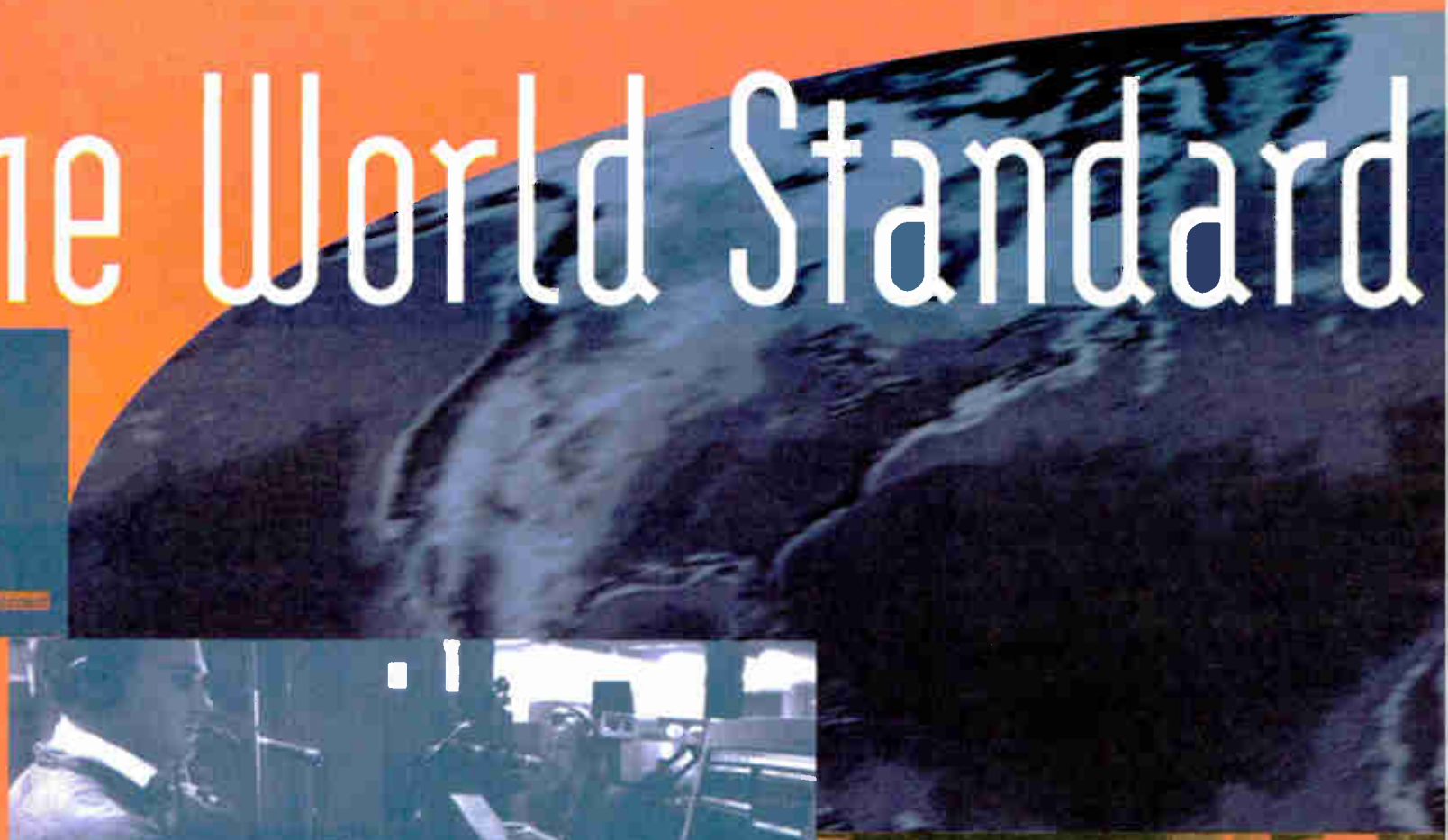

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SHORT TAKE

Valentino Presents New Library

It is a good bet some of your earliest production was done with music and effects from the Valentino Production Music Library. The streak is still going strong today with the release of the new Valentino Evergreen Collections, new sound effect CDs and Internet access to music.

There are 12 Evergreen libraries of 10 CDs each, with separate styles and subject headings. Categories include dramatic, comedy, cartoon, historic, dance, foreign, americana, documentary, electronic, instrumental solo and mystery. This collection is separate from the 90-CD Valentino production library.

Producers are able to select any combination of libraries in the collection, ordering one, two or all 12 in the series. Valentino libraries are available by license agreement, and the Evergreen Collection is priced the same as for the larger Valentino library.

In addition to Evergreen, Valentino has also added new selections to its sound effects library, now numbering 50 CDs.

Beginning in 1998, selections from both Valentino libraries will be available via downloadable bitstream technology over the Internet. Producers needing a specific piece of music, an effect or a combination of both will be able to directly download selections via a digital library system over the Web. The service will be available in several months at *www.tvmusic.com*

For information, contact Thomas J. Valentino, Inc., in New York at (800) 223-6278, by e-mail at *tvmusic@ibm.net* or circle **Reader Service 148.**

—Alan R Peterson

DVD: Power Yet to Come

▶ DVD, continued from page 13

and/or multimedia video with companion audio per side.

The average data rate for image and sound, including three audio channels and four subtitle channels is about 4.69 Mbits per second (Mb/s).

If the format will hold a full-length movie, complete with data-compressed 5.1-channel Surround sound, we are already seeing proposals for an Enhanced-Audio version of DVD that could feature as many as 10 discrete, uncompressed playback channels.

Recalling that a single channel of uncompressed 16-bit data at a sampling rate of 44.1 kHz requires around 5 MB of storage/replay capacity per minute, you can begin to appreciate how many channels or track-hours of digitized data can be coaxed onto the surface of a DVD platter.

With the recent advent of affordable PC-based DVD authoring systems from a number of vendors — most notably Sonic Solutions — many users are looking at the possibility of preparing sales training aids and the like, that can be put together easily and relatively cheaply for small-quantity runs.

This is comparable to using Recordable CD as a convenient means of preparing CD-ROMs of graphics materials or small-run audio CDs of selected library cuts, station IDs or even promo packages for use throughout a multi-room production facility. Many of us have already received or even created ad and jingle packages via custom-burned CDs.

Affordable desktop DVD recorders are still off in the future, but it will not be too long before we will be able to replicate high-capacity media in radio production studios. In fact, synchronicity struck again as news reached me of the Pioneer DVR-S101 DVD-R writer, which holds a great deal of promise for small DVD media runs.

More details of this new offering — which prepares DVD-Video and DVD-ROM discs holding 3.95 GB per side (total 7.9 GB) — will appear in my next column.

All of the wrinkles will eventually be ironed out; they have to be, as there are megabucks at stake. When this happens, the ability to record up to 17 GB of random-access data onto one disc could very possibly lead to the eventual demise of virtually every other format of removable media. DVD is definitely a wave of the future.

■■■

Mel Lambert has been involved with the production and broadcast industries on both sides of the Atlantic for several decades. He is now principal of Media&Marketing, a Los Angeles-based consulting service for the professional audio industry. Reach him at mediapr@earthlink.net *or at (818) 753-9510.*

Build With CD Architect

▶ CDR, continued from page 14

Instead of constantly starting and stopping the reel or LP record while digitizing, you load it in as desired; as a single WAV file or as several.

Next, separate CD tracks are defined with PQ markers. Levels are adjusted in relation to the entire disc. With this perspective, disjointed audio elements find their place in the context of the whole. Keeping an eye on the complete project is consistent with CD Architect disc-at-once capabilities.

But disc-at-once has drawbacks. Each recording session requires uninterrupted data flow. With CD burns running as long as 74 minutes, serious demands are made on the computer hard drive. If anything interferes, even a screensaver, you have irreparably destroyed that CD-R disc and must start over.

CD Architect provides numerous cross-checking features to minimize the risk. The safeguards, if observed, will keep you from making costly mistakes.

Another hazard is that the "tweaks" made by CD Architect (dithering, fades, etc.) are processed in real time during the burn. This eats up processor power and can slow recording speed from 4x to 2x, or even to 1x.

Depending on your computer capabilities, you may have to create *image files*. With these, all the fine-tuning is preprocessed to a separate file prior to burning a CD.

Impressions

CD Architect is not an all-purpose package, but is essential if you expect to do a large number of disc-at-once recording projects. For present Sound Forge users with these requirements, it is an elegant plug-in that significantly extends your CD authoring capabilities.

As an introduction to Sonic Foundry products, the CD Architect/XP bundle is a gem. With recordable CD units becoming more of a regular component in radio production studios, CD Architect could be the right tool to bring your analog archives into the digital age.

■■■

Carl Lindemann has authored a series of CD-R articles for RW, produces the syndicated radio show "Cyberscene" and manages its supporting website: www.radioshow.net

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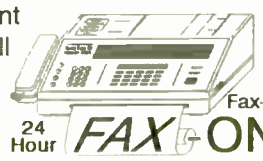

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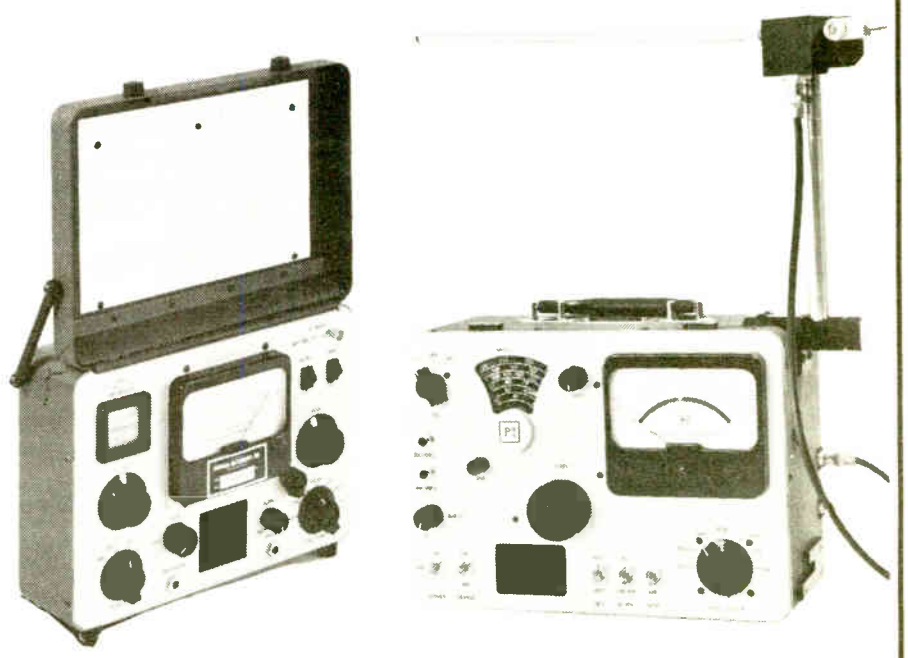

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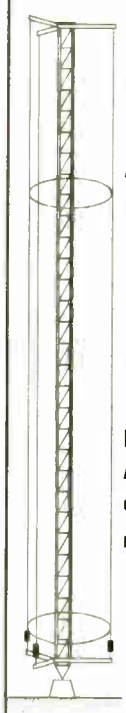

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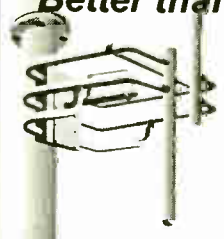

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World Radio History

Product Roundup From AES in the Big Apple

Alan R. Peterson

For audio engineers interested in the latest audio toys and tools, the AES Convention is like a stroll through Macy's Department Store on Christmas Eve. From mini-mixers up to gigantic multichannel surround consoles, portable cassette decks to 48-track reels and a mic for every possible purpose, the exhibit floor of the Jacob Javitz Center had the very latest gear.

AKG Acoustics created the Solid Tube microphone, a single-pattern, large-diaphragm tube condenser mic with a 12AX7 vacuum tube, operating at full rating off a high voltage rail. A ground lift switch avoids ground-loop hums and a clear red window allows the viewing of the tube in operation. This mic is expected to cost $1,195.

Alesis came to New York with the newest incarnation of the ADAT line, the Meridian M20 digital audio recorder, with 20-bit resolution and eight tracks on conventional S-VHS-type tape cassettes.

The company also exhibited a Special Edition ADAT machine with a chrome and stainless steel chassis and heavy plating throughout. There were 100 Special Edition ADATs built to commemorate 100,000 units sold.

Alesis also announced the shipment of its Wedge reverb module and the Studio 32 recording console with 16 phantom powered mic preamps, six Aux sends and fully parametric EQ section.

Acoustic correction and noise control products were in abundance from both **Acoustical Solutions Inc.**, and **Acoustics First Corporation**.

Acoustic Sciences Corporation (ASC) brought the TubeTrap back to the AES show, along with the ATTACK wall, a studio gobo system used to tame room acoustics when doing mixes on midfield speakers.

Aphex Systems put the Aural Exciter into digital form with the creation of the Aural Exciter Type IIIpi TDM plug-in, modeled after the Aphex 250. The plug-in is compatible with ProTools version 4 and other audio software packages that support the TDM standard. The user interface includes all Aural Exciter controls (Drive, Tune, Timbre) and now includes the ability to control Harmonic Density.

From **Apogee Electronics** came the AD-8000, an eight-channel digital audio converter. The rackmount unit features full 24-bit A/D and optional D/A conversion. Other options include the Apogee Multimedia Bus (AMBus) card series to interface the AD-8000 with ADAT, ProTools and other systems.

New products for a new exhibitor: **Audio-Technica**'s first AES exhibit included the handheld ATM89R condenser mic, the ATM87R high-SPL boundary mic and ATM23HE dynamic instrument mic.

The ATM89R is delivered as a hypercardioid, but interchangeable elements can create new polar patterns; omni, subcardioid and standard cardioid capsules are all available.

The ATM87R boundary mic is a flat-pack condenser, designed as a bass drum microphone. It is powered by a 48 VDC phantom supply and has high SPL capability and flat response.

The ATM23HE mic is a moving-coil dynamic meant for miking a drum set under live and studio conditions. The tight hypercardioid pattern controls feedback and provides high isolation from other sound sources.

See AES, page 22 ▶

Photo by Alan R. Peterson

The Lobby of the Javitz Center

AES Went Gold in New York

To be able to see and touch the very latest in audio technology, the 103rd Audio Engineering Society Convention at the Jacob K. Javitz Center in New York City was the place to be Sept. 26 through 29.

As the "AES Goes Gold" exhibit hall opened up, it was clear that computers were as plentiful as consoles and nearly as common. With the audio community gearing up for DVD and more Internet infiltration happening than before, the name of the game continues to be "digital" as the revolution rolls on.

For the audio pro, a great many workshops and technical papers were presented. One session on digital audio broadcast (DAB) got the attention of engineers and producers alike (see related article).

Several familiar faces floated through the crowd as well. Synthesizer pioneer Dr. Robert Moog came to show off his company's line of theremins (an electronic musical instrument performed by waving one's hands around a pair of antennae). Author/producer Craig Anderton, whose books on home recording and guitar gadgets inspired a generation ofhobbyists and pros alike, was spotted at the Digidesign exhibit.

And Rupert Neve, developer of legendary consoles, mic preamps and EQs, stopped to shake hands with nearly everyone.

In this section of **RW**, you will read about new audio equipment and the details behind the radio meeting that took place at the AES convention.

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World Radio History

▶ AES, continued from page 21

AudioActive audio streaming technology for the Internet was featured in the **Telos** booth. Also in tow was the Telos Zephyr range of ISDN codecs, including the ZephyrExpress, combining an interface with an audio mixing/monitoring system in one case.

The MicroAmp Series from **Audio Technologies Inc. (ATI)** drew as much attention at AES as it has at previous NAB shows. The miniature mixers joined the rest of the ATI lineup of broadcast mixers, preamps and mic processors. New in the lineup, the NanoAmp Stereo MX200 mic/line Mixer and MXS Stereo Field Mixer.

The newest offerings from **Audix** were the OM-6 dynamic microphone with low frequency extension and flat tailored response; and the D-4 dynamic mic which is capable of capturing high SPL sounds. Frequency response of both hypercardioid mics is to 19 kHz.

Monitor speakers from Audix included the PH5-VS and PH25-VS powered monitors, the Studio 1A and 3A Studio Series and the V and X Reference monitors.

Three new Dynaudio Acoustics monitors are out from **AXI, Inc.** The BM6, the BM 6A active monitor and BM 15A active monitor were all heard and seen at the AES show.

BASF came to New York with new tape products for the digital multitrack market.

BASF Brand ADAT Tape is meant for repeated play and rewind cycles in Alesis ADAT-compatible machines. According to the company, the back-coated tape formulation, precision shell and tape guidance elements assure tight tracking and low error rates.

BASF also introduced DTRS Master Tape for Tascam DA-88 compatibles. The DTRS product is available in 30, 60 and 113 minute lengths.

A Cool Stuff recipient, **Benchmark Media Systems** exhibited its full line of distribution amplifiers and high-quality D/A-A/D converters.

Mics from **beyerdynamic** included the revolutionary MCD 100 with its built-in A/D converter, providing AES/EBU digital audio directly to the console; and the MCE 82 stereo condenser mic for ENG.

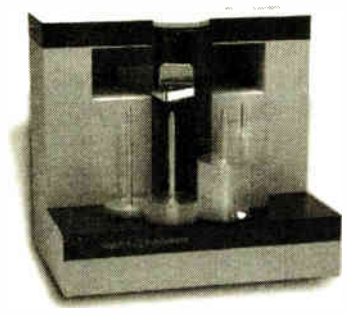
Radio producers that use Mac-based machines should know about **bias** and its line of audio products for this platform. Among them, the SFX Machine which recreates analog modular synthesis effects and processing on computer. The software can create AM or FM synthesis, ring modulation, chorusing and a number of digitized special effects.

Version 1.6 of Peak LE was released at the AES show. The Mac-based audio editor can encode RealAudio files, perform all types of audio recording and editing and includes DSP effects such as vocoding.

The large blue mic at the **CAD Professional Microphone** display was the VX2, which uses twin tube circuitry, dual 1.25-inch gold-sputtered capsule and custom transformers.

New amplification at the **Carver Professional** booth included the PX Series of power amps, joining the Contractor, Touring and Pro Audio series. Accessories include balanced and unbalanced connectors, Y-adapters and eight-channel snakes.

Mass CD duplication is possible with the **CopyPro** CD-R 5000 autoloader. This unit duplicates CD-R discs with up to eight writing drives and has capacity for 450



CDs. With eight drives, the CD-R 5000 can turn out 32 discs per hour.

Giant mixers came to the show, courtesy of **Crest Audio**. The V12 performance console uses 12 VCA groups and doubles as a monitor mixer, while the X Series application-tailored mixer is set up for recording and live performance.

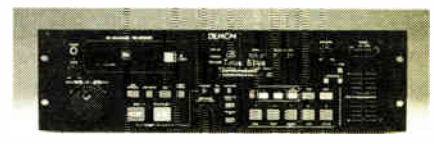
A new mini-boundary microphone system was introduced by **Crown International**. Based on the same technology in Crown's pressure-zone mics, the new series takes the boundary mic down to a small size while retaining accuracy in reproduction. Crown also showed its line of colorful K Series amplifiers and TEF products.

Another Cool Stuff winner, the Omnia.fm processor from **Cutting Edge** was seen in New York. The new digital FM processor saves processing data on PCMCIA cards and features a 10BaseT modem connection for remote access and adjustment.

Processor manufacturer **dbx** brought out the diminutive MC6 mini-compressor; a

tabletop unit with five slider controls and switchable Over-easy compression. The company also had a line of EQs and spectral enhancers as well as the Project 1 line of less-expensive processors.

Denon Electronics rolled out the DN-M1050R and DN-M2000R MiniDisc

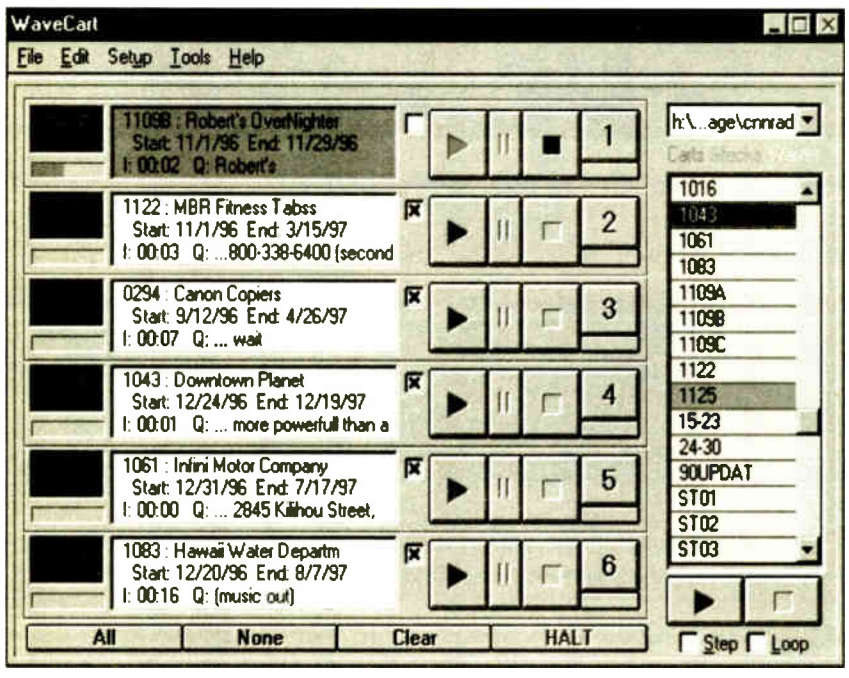


recorders, with a familiar button and panel layout similar to other Denon products. Also out, the DN-T620 combination CD/cassette deck and DN-C680 CD player.

For ProTools users, **Digidesign** and **Digidesign Development Partners** exhibited new plug-ins and hardware products from Mackie, Opcode, Steinberg, QSound Labs and other manufacturers

See AES, page 24 ▶

On-Screen Cart Machine



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World Radio History

DARE

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▶ AES, continued from page 22

Another Cool Stuff winner, the **Digigram** PCXpocket PCM laptop soundcard, came to New York as the PCXpocketAD; now compatible with a wide range of popular commercial digital audio editors. The card also offers a S/PDIF digital input for direct dubbing from DAT, MD or other digital device.

Metering technology was provided by **Dorrough Electronics**, with a full line of analog loudness meters, AES/EBU meters and the Model 1200 Stereo Signal Test Set.

Earthworks returned to New York with the LAB101 recording mic preamp and the M55 measurement mic. The LAB101 claims flat response from 2 Hz to 100 kHz, has phantom power, phase reverse and stepped gain from 0 to 66 dB. The M55 mic can be used for acoustic testing as well as recording, with response from 5 Hz to 55 kHz.

Ensoniq, known for samplers and synthesizers, brought out the new PARIS workstation. The Professional Audio Recording Integrated System (PARIS) has cross-platform (Mac/PC) compatibility, EDS-1000 PCI card, external rackmount converters and 16-channel hardware control surface. PARIS can play up to 128 audio tracks and can record up to 16 tracks simultaneously.

Equi=Tech moved its balanced power technology into a smaller unit: the ET1R. This compact and inexpensive product uses the same toroidal transformer concept for balanced power distribution as is used in the larger units, such as the ET10W.

Multitrack editing hardware came from **Event Electronics**, which displayed its Darla 20-bit audio recorder with eight assignable channels and RCA-plug breakout box; the Layla digital recording system with S/PDIF I/O, eight balanced analog inputs and ten outputs, MIDI interface and external word clock sync; and the Gina with four inputs, ten outputs and S/PDIF digital I/O.

All three products are full-duplex devices and come with diagnostic and basic multitrack software packages.

Event also exhibited the EMP-1 ultra-low-noise microphone preamplifier and the RØDE Classic, NT-1 and NT-2 studio mics.

From **FairlightUSA** came the MFX3plus 24-track digital recorder/editor with high resolution waveform displays, clip-based EQ, a dedicated controller surface and Timefx software with six different time-compression algorithms. The Fairlight FAME digital console/editor was also displayed at the AES.

Fostex Corporation debuted a new CD recorder — the CR200 — in New York. The device is able to take input from any audio source including hard disks, MD, DAT and cassettes. Digital fader functions and synchronized recording modes make the CR200 a versatile addition to the CD authoring suite.

The D-160 removable hard disk recording system began shipping around the time of the AES show. The recorder is available in three configurations, offering options for timecode and D-sub interfacing to pro consoles.

More mics came courtesy of **Groove Tubes**, which brought the Model 5SC FET cardioid condenser microphone, the 5SM with mutliple polar patterns and the 6TM vacuum tube with multiple patterns. Another eye-catcher was the **Lawson** L47 Gold Microphone, produced in both solid-state and tube versions. The mic features a reproduction of the U47/M49 capsule, with 3-micron diaphragm.

Hafler entered the Jacob K. Javitz Center with the P4000 Trans-Nova amplifier. The 200 W per channel amp is convection-cooled, features Hafler's Transnova circuitry and uses a new technology called Dynamic Invariant Amplification Optimized Nodal Drive (DIAMOND).

On display from **HHB**, the CDR800 CD recorder, PDR1000 PortaDAT recorder and recording media for MD, CD-R, MO and ADAT machines.

JBL Professional debuted its LSR 32 three-way midfield monitor, designed for multi-channel playback of audio for film, music production and video.

A 12-inch Neodymium woofer is coupled to a 5-inch midrange driver with a 250 Hz crossover. A 1-inch composite high frequency diaphragm is integrated with a waveguide that provides 60x100-degree dispersion.

The JBL-SMAART PRO acoustical analyzer is a Windows 95/NT-based software solution for acoustical measurement and system optimization.

Dynamics processing for studio and broadcast uses came from **Junger Audio/G Prime Ltd**. The d01, d02 and d03 are suited for recording, while the d05 and digital VAMP1 and VAMP2 units are appropriate for on-air operation.

The long-awaited HUI (Human User Interface) from **Mackie Designs** was designed as a full-featured controller/interface for Digidesign's ProTools audio workstation. The console features motorized 100 mm faders, full transport controls, window and zoom controls for the ProTools on-screen appearance, insert and DSP controls and two Mackie mic preamps.

The Mackie Digital 8•Bus is a 48-input, 8-bus automated digital console with 100 mm motorized faders; DSP compression, gating and EQ and an on-board computer with 1.2 GB hard drive. Estimated cost of the Mackie Digital 8*Bus is to be $4,000.

Seen at the **Marantz** booth, the new PMD680 portable solid-state recorder and PMD520 dual-well three-head cassette deck. The CDR615 and CDR620 CD recorders were on display as well as the Marantz line of portable cassette recorders, longtime favorites of radio news reporters.

The large Neotek Esprit console, distributed by **Martinsound**, is designed for modern broadcast production. The Esprit has eight group busses and eight auxiliary busses, four-band state-variable EQ, talkback and full on-air mute logic.

CD duplication was the word at **MediaFORM**, debuting its CD2CD/PRO series duplicator. The device copies up to six CDs on-the-fly and can be interfaced with conventional DAT drives via S/PDIF or AES/EBU ports.

Merging Technologies added new features to last year's Pyramix Virtual Studio, including DVD-compatible sampling rates up to 96 kHz, punch in/out recording, file format conversion and indicators showing the four DSP chips are in use.

More CD duplication technology came from **MicroBoards Technology** with the new Cedar 50 disc autoloader. This unit combines a 50-CD autoloader, recording decks and a built-in multicolor label printer. The system is supported by Sonic Foundry's CD Architect for unattended operation.

Under a set of inflatable floating lights, **MUSICAM USA** displayed the low-cost RoadRunner ISDN codec/mixer with Layer II, II and G.722 coding; the CDQPrima rackmount codec and the new version Fieldfone/Studiofone combo, offering 9 kHz response over a conventional POTS line.

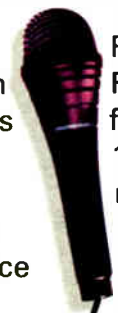
Classic mic manufacturer **Neumann** introduced a low-cost, large-diaphragm microphone — the 103 — and added the AK20 capsule to its KM100 miniature mic system.

Otari Corporation made a leap into

See AES, page 26 ▶

628 Digital Voice Processor

It Takes Requests & Doesn't Need Coffee!



You've received over a dozen requests in less then 15 minutes and the phones still ringing! If that isn't enough, your program director wants the presets changed & needs your voice on a cart "ASAP." All this and you haven't even had your first cup of coffee! The day's just starting, you may not be up to speed, but the Symetrix 628 Digital Voice Processor is!

The Symetrix 628 Digital Voice Processor is made for broadcasting, live performances & recording studios. The 628 provides a quick way for talent or producer to make speedy changes without frantically running to the equipment rack!

The 628 offers instant on air capabilities. A simple turn of a knob selects any of 119 user personalized presets or one of 8 factory presets. With the touch of a single button from an optional remote, the 628 enables 11 presets and includes a bypass function.

The 628 is a transformerless & capacitorless mic preamp.

Filters in the 628 eliminate RF interference and features like the switchable 15 dB pad, which prevents microphone melt downs are essential for quality end results. Along with easy plug to play operation, independent metering process functions, microphone & line level outputs. The 628 provides AES/EBU and S/PDIF digital outputs. As well as 20 bit A/D & D/A converters. The Symetrix 628 offers a parametric approach to equalization allowing cuts & boost exactly where needed and provides sound signal processing every professional demands!

Better yet the Symetrix 628 Digital Voice Processor with onboard de-esser, expander/gate, compressor & processing power takes up only one rack space! Intervention & Independence... that's what the Symetrix 628 Digital Voice Processor is all about. So go have your coffee!

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The Omnia.fm all-digital processor

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World Radio History

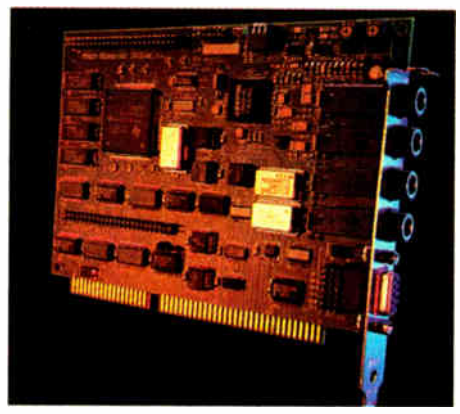
▶ AES, continued from page 24

the digital console arena with a first glimpse at the Advanta large-format digital console.

The Advanta offers up to 256 inputs in a system capable of handling digital formats up to 24-bit and 96 kHz rates.

The Advanta is not expected to be seen in radio stations anytime soon, as it is meant for music and film/post uses. However, Otari also exhibited its classic 5050 analog reel recorder, a fixture in radio stations for close to two decades.

Power Technology, makers of the DSP-FX computer-based processing system, presented the DSP-FX-XC sound and effects processing card. The XC card provides direct recording and playback support for most popular PC audio software packages. The card is joined by



Monolith, a compact desktop box configured with one to four XC products for eight simultaneous ins and outs to a PC.

Presonus made things colorful with two new blue compressors; the Blue Max preset compressor with a rotary encoder for optimum performance with specific sound sources, and the ACP-22 two-channel rackmount compressor/limiter.

From **Prism Sound** came the Dscope Series III computer-based oscilloscope/analyzer, the Maselec MEA-2 EQ and Dream Series AD-2 96 kHz A/D converter.

Quantegy had what it took to keep recording machines well-fed, with an extensive line of magnetic and optical media.

Quantegy manufactures both standard and Data MiniDiscs for use in conventional and multitrack MD recorders. Magneto-optical (MO) discs, DAT tapes and media for both ADAT and DA-88-type machines were also part of the Quantegy product lineup.

The company continues to make analog cassette and reel tape, based on improved formulas of the former Ampex and 3M lines. Quantegy 480 analog tape recently received Nagra certification for recommended use on Nagra tape recorders.

Rane Corporation rolled out the programmable RPM26 multifunction processor and CP64 commercial processor.

The RPM26 is a software-controlled processor with two inputs and six outputs. Under Windows, it can be configured as a crossover, compressor, delay, parametric EQ and limiter. Eight of 16 memory locations can be recalled by contact closure on the back panel.

The CP64 is actually a zone paging system with four inputs and three-level page priority. While not actually useful for studio work, it is appropriate for use in a station's house music system with the ability to "duck" background music with an in-house page.

Roland Corporation showed up with the new CD recording system for the VS-880 workstation, the A-90EX expandable controller and the entertaining Boss VT-1 Voice Transformer and "Dr. Sample" miniature sampling unit.

Feedback continued to be no problem over at the **Sabine** display, as the company featured the FBX 1020, 2020 and Solo 620 feedback eliminators.

Samson Technologies brought new Behringer tube and digital processors to New York, as well as the new line of Samson Synth Series wireless mics and the inexpensive ($189.99) rackmount Zoom 1201 studio reverb.

The word was "wireless" at the **Sennheiser** booth, with its 3050 in-ear monitoring system for performance and the 1015 Infrared Series of headset monitors. The MD425 supercardioid mic was featured, as was the HD600 stereo headphones.

Sennheiser literature at the AES show emphasized the company's NoiseGuard line of headphones and headphone/mic combinations. This product measures low-frequency noise components, then electronically subtracts them from the signal being fed into the headphones.

Shure Brothers also took on feedback with its DFR11EQ Digital Feedback Reducer. This device couples to a Windows 95 computer for system control and features a Motorola 56009 DSP circuit. On its own, the DFR11EQ tracks and eliminates feedback with ten 1/10th octave filters. Combined with a PC, the device can display and edit feedback filter depth and frequency and can perform graphic and parametric equalization.

Live broadcasters got a look at the **Solid State Logic** Aysis Air 48-channel digital console, with eight Aux sends, snapshot automation and 20 mix-minus feeds for extended telephone use.

Sonic Solutions is still producing its Mac-based on-air software package for radio production, but otherwise has jumped into DVD with both feet.

Sonic Studio delivers a number of features targeted to radio broadcast production, audio post and CD mastering. Now, Sonic DVD Creator combines authoring, multichannel audio, variable bit-rate MPEG video and up to 32 subtitle streams in its software suite. Multiple

See AES, page 27 ▶

Scott Studios' Breakthrough: Uncompressed Digital Audio at a Compressed Price!

Your station can make the quantum leap to ***uncompressed*** digital music from hard drives! ***You'll hear the difference*** in quality from this superior system!

Best of all, Scott Studios' ***killer*** new linear audio ***costs no more*** than compressed systems! Scott Studios is the ***only*** company playing ***four*** great sounding ***uncompressed*** digital stereo streams at 24kHz, 32kHz, 44.1kHz, 48kHz or any mix ***with overlap*** and ***while recording!*** ***No*** other system uses the sizzling hot new Motorola 56301 DSP chip and ***32-bit PCI bus*** audio cards! ***Only*** Scott Studios' system prevents dueling algorithms and eliminates compression artifacts with linear audio ***at no extra charge!***

You also get a fail-safe watchdog for ***unequaled*** reliability, a 6x6 preview switcher that lets you hear ends of spots or songs while the middle is on-the-air, superior headroom, General Purpose Interface, digital ins and outs, optional timing stretch & squeeze, optional MPEG or APT, and more.

Scott Studios exclusive new 32-bit PCI audio card plays up to four CD quality uncompressed stereo channels while recording!

Good Spot Box

Scott's new digital Spot Box triple-deck "cart" replacement delivers awesome ***linear*** CD quality sound.

Spot Box is the ***easiest*** digital system to use! There's only one screen, so your jocks always know what's happening. At the left, three players give you legible labels, countdowns and End-of-Spot signals, with big well-lit buttons that show what's playing. Even though it uses Windows® 95 or NT, Spot Box works like carts, ***not*** a computer. At right, there's a "rotary cart rack" that lets you pick and play any recording by number or name. Or, number keys at the bottom load your cut quickly.

As options, Spot Box can automatically load logs from traffic by diskette or LAN. You can record spots and edit phone calls at the right of the screen.

Starting at $5,000, Scott's Spot Box is so affordable many stations can even put two in an air studio for redundancy.

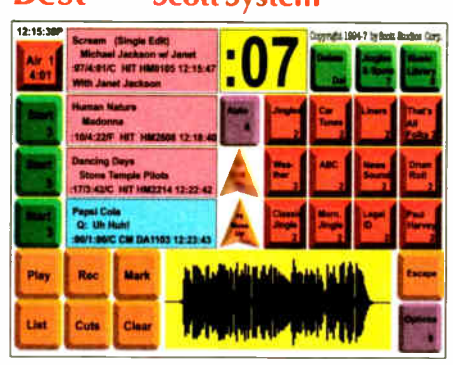
Better AXS®

AXS® (pronounced ax'-cess) is radio's premier digital audio system for satellite or news/talk formats, CD automation and cart replacement for live jocks. AXS® gives you instant play Hot Keys, log editing, music on hard drive, Power Fill, satellite jock substitution, link to NPR's SOSS, an easy-to-use Real Time Scheduler, the industry's simplest and best net catcher, and an optional production or phone recorder and editor in the air studio.

Scott Studios offers AXS® satellite systems as low as $7,500 complete.

With Spot Box, AXS® or a Scott System, you can get 24 hour, 7 day support from Scott's 45 person staff—the biggest (and best) in digital audio! With several of these systems, any can record a spot once for all! Also, for spot or music on hard drive with typical playlists, you choose whether to get ***uncompressed,*** MPEG or APT digital audio cards at no difference in price.

Best Scott System



The Scott System is radio's top-of-the-line for digital music on hard drive. You get instant play Hot Keys, touch screen music libraries for instant requests, log editing, built-in phone recorder, pre-recording Voice Trax in context, and production that imports from any WAV digital multi-track.

Scott also offers an ***invincible*** seamless redundancy option. It's self-healing, so regardless what happens, your spots and hits just keep on comin'!

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World Radio History

▶ AES, continued from page 26

workstations are combined in the creation and authoring of DVD titles using the new Sonic DVD Creator.

For field radio work, it was hard to top the **Sonifex** Courier portable recorder, using PCMCIA media for recording and editing. A graphical scrubwheel performs the edits and transfer of audio can be done directly out of the unit via phone or ISDN.

Sony continued to enhance the popularity of MiniDisc with the inexpensive JE510 MD recorder (list price $360) and the MZ-R30 portable MD recorder for journalists and musicians. The MDM-X4 multitrack MD deck has already shipped 40,000 units worldwide.

The new 24-bit Sony Oxford console was revealed at the AES show. The huge digital console can accommodate up to 120 input sources for mixdown and its multiformat architecture can be configured for up to eight-bus surround sound.

Soundcraft came to the show with its popular Ghost and Ghost LE consoles and introduced the new Series Five production console with eight groups and 12 Aux feeds.

Sound Ideas rolled out the Mix IV Broadcast Music Library with 12 new CDs of royalty-free broadcast production music, and the General Series 6000 Extension that adds another 3,000 cuts to the original General collection. Soon to be out will be the Rocky and Bullwinkle collection; a library of cuts from the original Jay Ward animated television series.

Soundscape Digital Technology came back to the AES show with the latest versions of its SSHDR-1 workstation. The SSHDR-1Plus features a six-fold increase in DSP power, enabling the user to run new Version 2 software.

Radio users already familiar with **Spectral** workstations got to see the lower-cost Prisma DAW in action. The Prisma has eight simultaneous ins and outs, full editing capability and sync to almost any studio timing reference.

Tape fans take note: **SPL** of Farmingdale, N.Y., introduced Machine Head, a rackmount digital processor that simulates the effects of analog tape saturation. The company also brought the Dynamax compressor with soft-limiter and noise gate.

Symbolic Sound came out with new software for the Kyma/Capybara audio synthesis workstation. New programs include modules for voice processing, analog synth emulation, backgrounds and sound effects.

New from **Symetrix** is the two-channel 562E Windowing Expander/Gate, with fast attack and smooth, natural release cycles; and the 533E Graphic EQ with internal power supply and ultra low-noise and distortion figures.

Keeping things quiet in the studio was A^{rt} Diffusor Model F from **Systems Development Group**. The product is designed for high-frequency diffusion. The company is well known for Cutting Wedge acoustic foam and fabric-covered Sonora Panels.

Last year, **Tascam** generated interest with its new unnamed digital mixer. This year it is called the TM-D8000 and joined the lineup of other products in the Tascam exhibit; including the DA-98 digital multitrack recorder, DA-302 Dual DAT machine and MD-501 MiniDisc Recorder/Reproducer.

From **TC Electronic** came the FireworX multi-effects processor, with 24-

bit resolution A/D and D/A, analog and digital I/O, high-powered reverb and delay effects, vocoding and numerous other effects. The newest broadcast processor, the DBMAX, features five bands of expansion, compression and limiting; a new EQ with multiband clipping and an adaptive automatic gain controller. The company also came out with version 3.5 software for its M5000 digital processor.

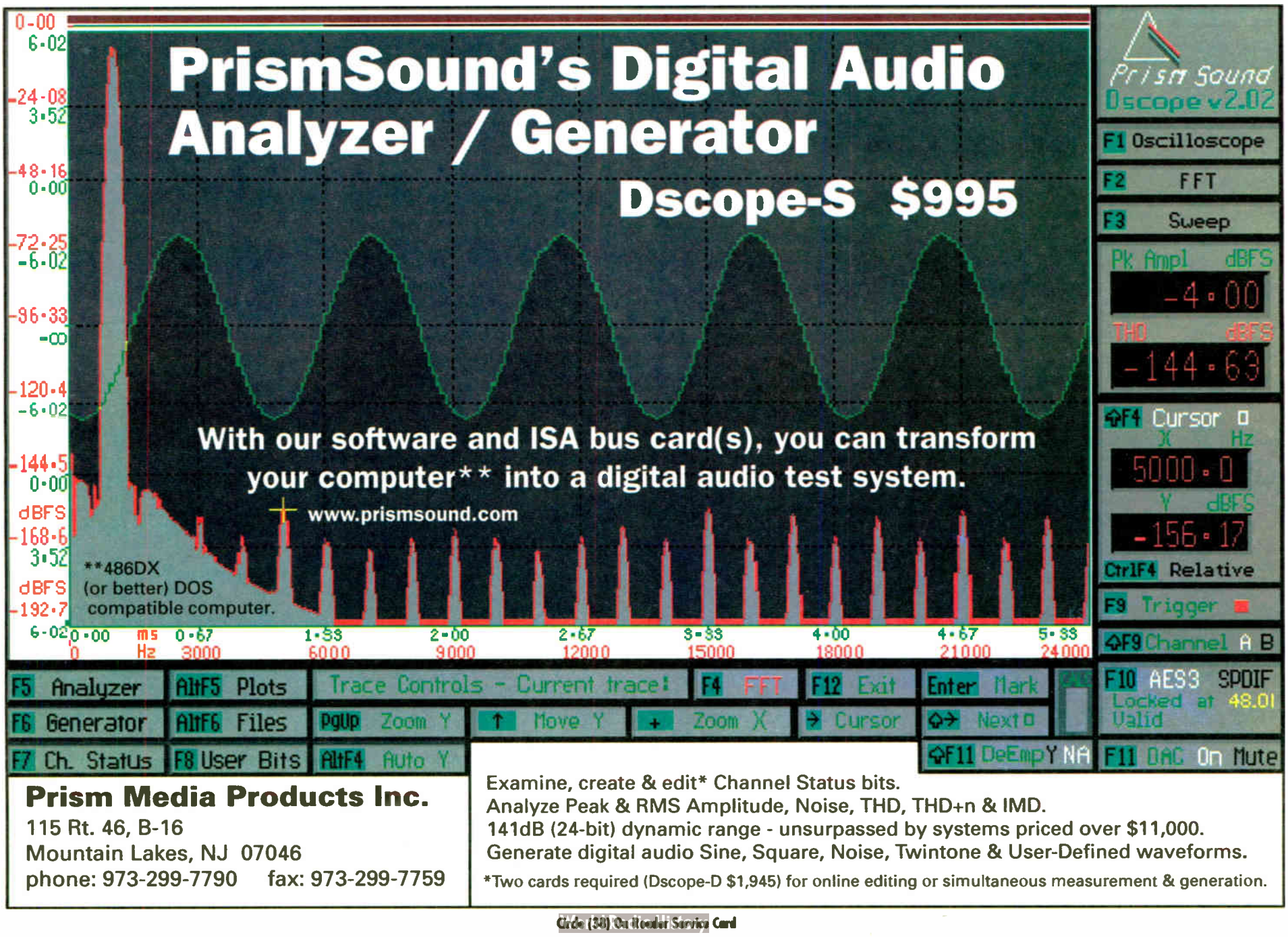
Noise reduction software DART PRO from **Tracer Technologies** has been brought up to 32 bits and now includes pitch shifting, 3D spectrum analysis and a new function allowing the recording of 78 rpm records at 33-1/3, then translating it in-computer to its original speed. Tracer also announced a distribution agreement with Applied Magic Inc., for its line of OnStage 20-bit sound cards.

Waves Ltd. teamed up with Galim Ltd. of Tel Aviv to introduce the AP24 DSP audio processor, a 24-bit audio card for Windows and Mac PCI systems. The card includes the entire complement of Waves plug-ins, including the L1-Ultramaximizer, Trueverb and the new PAZ-Psychoacoustic modeler.

WaveFrame Inc., has version 6.2 software for all WaveFrame/StudioFrame products, including the 401, the newest 408, the DAW-80 and DCS models. The new software speeds wave redraws, supports multiple file formats and multi-channel AES/EBU digital I/O.

The new WaveFrame 408 is designed mostly for film posting, but shares architecture with all WaveFrame predecessors. The 408 includes 64-bit ATI graphics, Sony P2 and ES machine control and includes an integrated SCSI controller for multimedia.

Yamaha emphasized its line of Club Series IV speakers and P Series amplifiers, and also featured new Version 2 software for the 02R console. The 03D digital mixer was shown in a number of configurations at the AES show.



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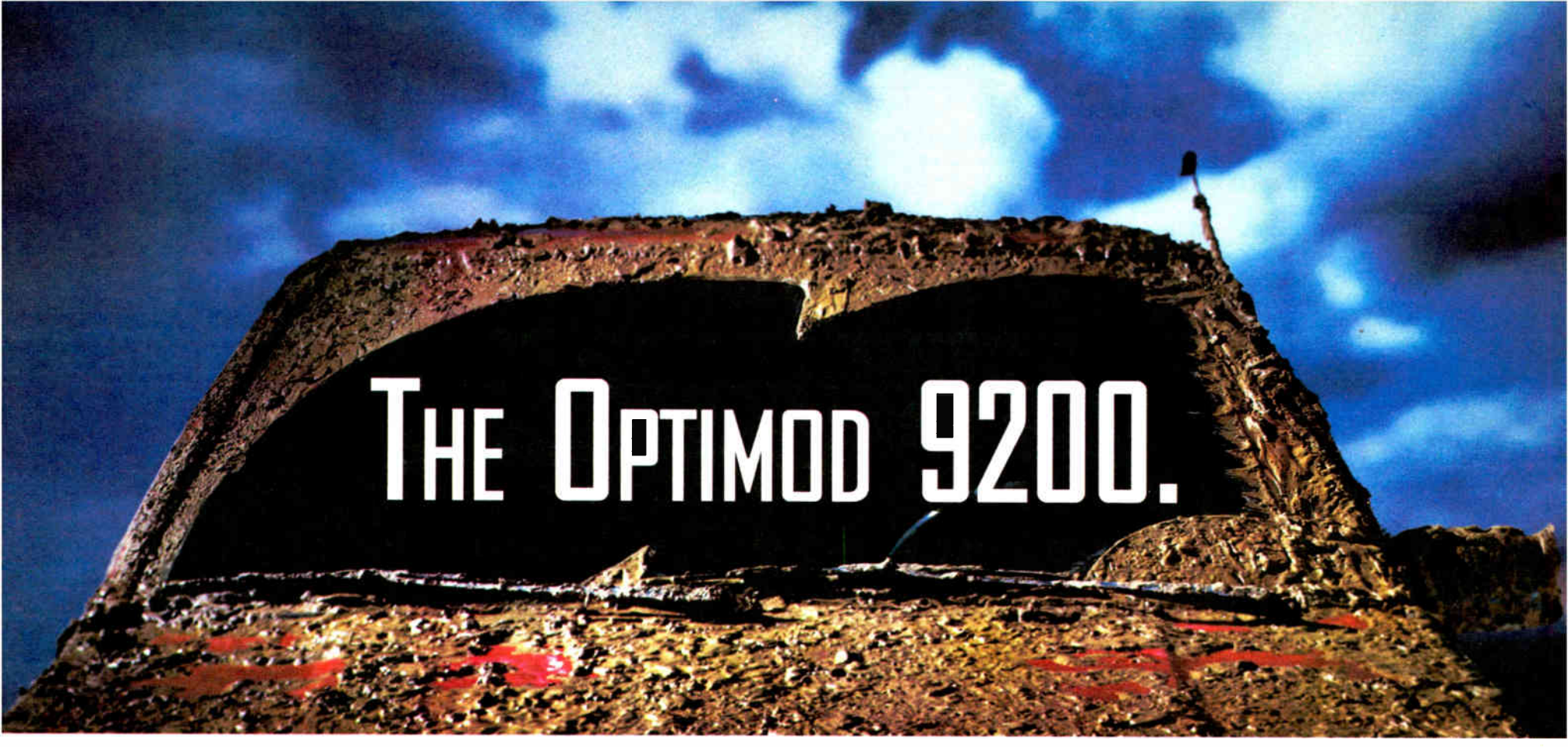

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World Radio History

AES Looks at Digital Radio

Alan R. Peterson

A session on digital audio broadcast might seem out of place at the AES show. Still, the workshop called to open the convention was on that very topic.

The event was chaired by David Bialik of DKB Broadcast Associates and Judith Gross of JG Communications.

"For many years we heard about the controversy, but for the last two years things have been quiet," said Gross. "They had a technical seminar at the NAB where USA Digital Radio (USADR) did its thing, but the AES saw fit to give the world the first real status report on what was going on with DAB."

The power panel included David Layer of the NAB; Gerald Chouinard of the CRC; Robert Briskman of CD Radio; E. Glynn Walden of CBS Inc.; Rick Martinson of Westinghouse Wireless; Ralph Justus of the Electronics Industry Association (EIA); Peter Kroon of Lucent Technologies and Andy Bower of the R&D division of the BBC.

Speak your piece

Layer reiterated the NAB position: U.S. broadcasters want an IBOC system. To this end, a system from USA Digital Radio is expected to be ready for testing by late 1998.

But the rest of the world won't wait, argued EIA's Justus.

"The world is going digital," he said. He argued that if U.S. radio is to survive, it must keep up with the rest of the globe. While not endorsing the system, he said Eureka is superior. He claimed the USADR system can cause receiver interference to analog FM reception.

Meanwhile, CD Radio is moving ahead with S-band satellite-delivered broadcast.

"Three satellites are being built now," said Briskman. "Two are planned to be launched in August and October 1999." He expects 30 CD-quality narrowcast music channels and 20 voice channels to be in operation by the end of 1999.

"This is the silent threat that broadcasters know about and they oppose," Gross said, "but there is nothing they can do about it. ... Satellites could conceivably be on the air prior to U.S. broadcasters going on with terrestrial service."

The view from Canada

Chouinard explained the Canadian approach of Eureka L-band broadcasts, optimized for 700 MHz terrestrial and 1.2 GHz satellite broadcasts.

"Canada is going with this," Chouinard stated, "and I wish the U.S. would as well." Chouinard asked the entire room, "Have you guys *tried* going back and getting that spectrum, in case IBOC won't work?" The question went unanswered.

Canada has four test stations, and intends to have a full digital facility in Toronto in 1998, with receivers hitting the market in spring 1998. Chouinard anticipates 15 stations to be on the air then. By 2000, he said, half of Canada's population should be able to receive a digital broadcast.

Bower of the BBC said Eureka is on in the United Kingdom, and that they are multiplexing data services with the signal. A computer coupled with a DAB receiver can create video text with an Internet appearance. Because most U.K. radio listening is done at home rather than in the car, he said, the concept is valid.

Global developments

"What we need from our radios seems to be out of sync with what is wanted in the U.S. We are doing multimedia DAB."

The BBC has 20 Eureka transmitters on the air and is building a 27-station single-frequency network. Meanwhile, Germany is evaluating the process; Sweden is approximately 75 percent Eureka capable; Australia and China have pilot services on the air; Japan is doing lab and field tests.

Walden of CBS, a participant in the USADR project, said 30 engineers and more than 10,000 hours of on-air test work have gone into its domestic IBOC system. New compression and data rate technologies, he said, have squeezed the AM rate down to 48 kbps with Lucent's PAC compression. This delivers FM quality of 15 kHz and 30 dBu separation. At 32 kbps, "FM-like" 12 kHz quality is achieved.

Walden said this research produced a side benefit: Certain characteristics of AM propagation and behavior came to light. This led to a computer simulation program and a paper for the IEEE.

First and second channel adjacency issues are still being addressed, he said. A coding technique called First Adjacent Cancellation helps reception by providing a "two-sided" signal; if one side of a digital signal is affected by interference, a second side still can deliver the broadcast.

The recent series of tests in San Francisco whipped up lively discussion. Some participants criticized USADR for not participating in field tests. Eureka proponents claimed victory in those tests, although critics said it worked only 80 percent of the time with two transmitters. Difficulties in satellite tests and the matter of power measurement (ERP vs. actual transmitter power) also were discussed.

World Radio History
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Melting Metal: Solder but Wiser

Quality Soldering Goes a Long Way. But Before You Try It, Review Some Important Basics.

Stephen H. Lampen

If there's one talent that separates the professional from the amateur, it is soldering. A good soldering job is a thing of beauty. A bad soldering job can be a disaster waiting to happen.

First things

Like many skills, soldering is a combination of two factors: understanding what you are doing, and practice. If you're new to soldering, I'll leave the second factor up to you. I'll concentrate on the first.

Soldering involves the melting of metal on metal to make a connection. The metal which melts is the solder and usually contains a combination of tin and lead. Use solder that has rosin flux built in. Flux allows the molten metal to flow and bind to the solid metal of the connector. You can get separate solder and separate flux, but it's a lot easier to get the flux built in.

If you check out solder at your local hardware store, hobby shop or electronics distributor you will find it available on rolls or dispensing tubes, in an array of diameters. With each smaller size, it becomes easier to use on fine parts and small assemblies. As the size goes down, the price goes up. You might want to have two or three sizes available, depending on the connectors you most commonly use.

To heat the connector parts, and melt the solder, you will need a soldering iron. Stay away from soldering *guns,* which are intended for much heavier work and are inappropriate for fine hand wiring. Your soldering iron will have either a fine tip or removable tips.

With removable tips the selection ranges from medium to very fine. For safety, make sure the iron you buy has a 3-pin AC cord; if you accidentally touch a high-voltage circuit, the iron will connect it to ground, instead of connecting it to you!

You also should buy a small stand for the iron, which can hold the soldering iron while it is hot. Buy a stand that also has a place for a sponge.

The sponge should be damp — not wet — when soldering. Use the sponge to clean off the tip of the iron between uses. The solder that naturally coats the tip of the iron has a tendency to rapidly oxidize because of the heat. This interferes with solder's ability to flow and attach to the metal of the connector. Wiping it off the tip gives you a clean oxide-free surface. Wipe it often.

For the ultimate in soldering, there are "solder stations." These include low-voltage supplies for the iron, temperature control and even thermal sensing, which allows the iron to automatically adjust to stay at the temperature you require. These can run into the hundreds of dollars. However, if you're going to do a fair amount of soldering, they are highly recommended.

Stay away from soldering guns, which are inappropriate for fine hand wiring.

Careful what you touch

One problem is the grounded tip of the iron. If you are working with low voltage signal circuits (i.e. non-lethal voltages) it is possible that you might touch the tip of the iron to these circuits. Your iron can short the signal out (i.e. short it to ground), which at least will unbalance the signal and increase noise or, at worst, short the signal out and make it go away.

If it's a power-supply bus you touch, you can blow fuses or circuit-breakers. Remember: Broad-cast facilities cannot shut down simply to allow you to solder something in the rack. If you short or blow an on-air or critical circuit, someone will find you shortly and administer an appropriate punishment.

The best solution is to buy a cordless iron. These are rechargeable soldering irons, specifically for small, detailed work. They only heat the tip when you push the button. Many have a little work light that shines onto what you're doing. This can be a godsend in a dark rack. Since these irons are battery-operated, the tip-on cordless irons are not at ground and cannot short anything out. Just remember to keep the iron fully charged for those times you need it.

■■■

Stephen H. Lampen is the author of "Wire, Cable, and Fiber Optics for Video & Audio Engineers" (McGraw-Hill) and is the technology development manager at Belden Wire and Cable.

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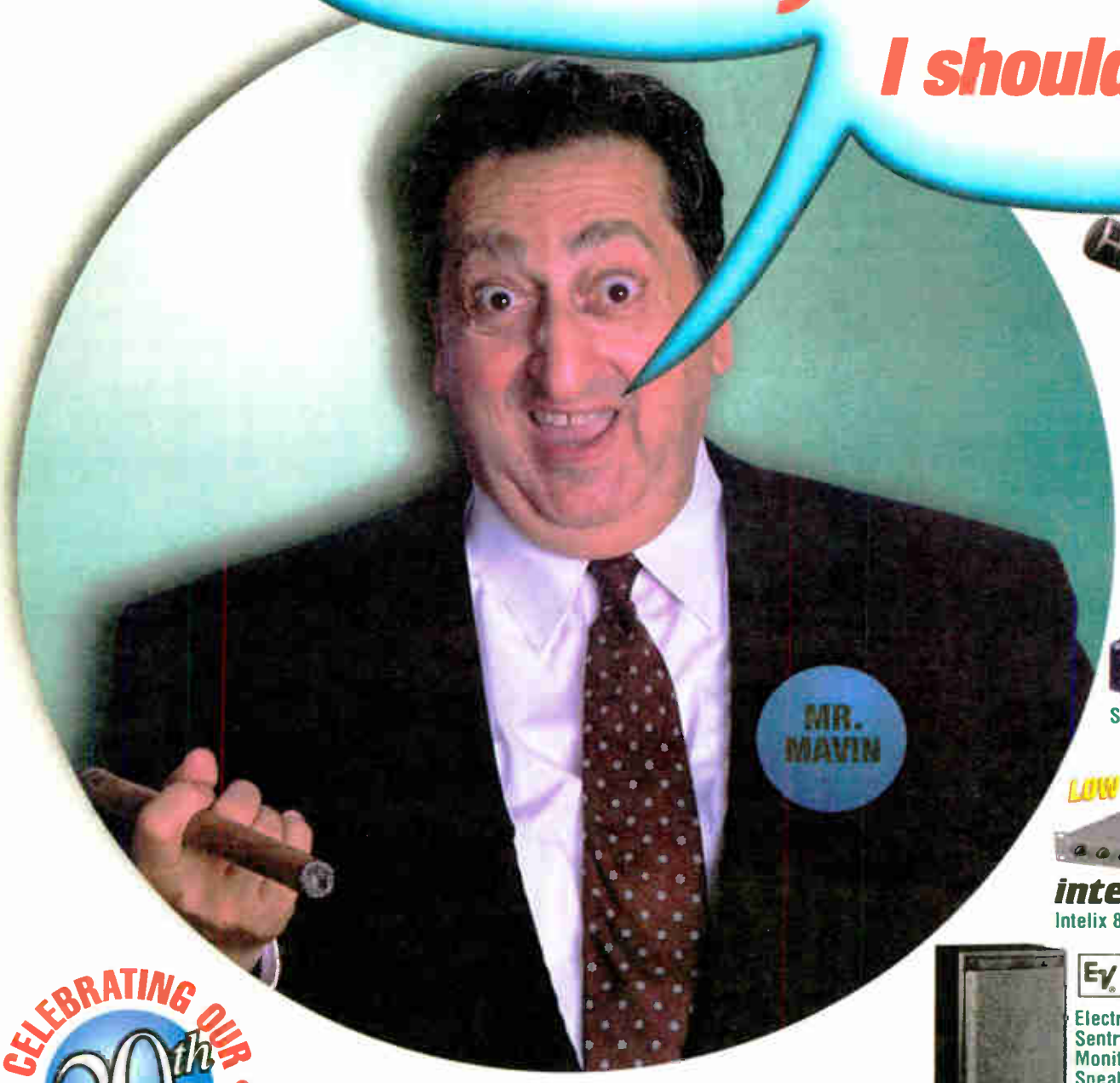
Find a better deal, eh?

I should live so long!



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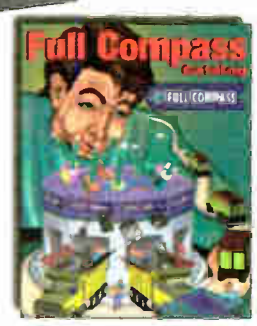

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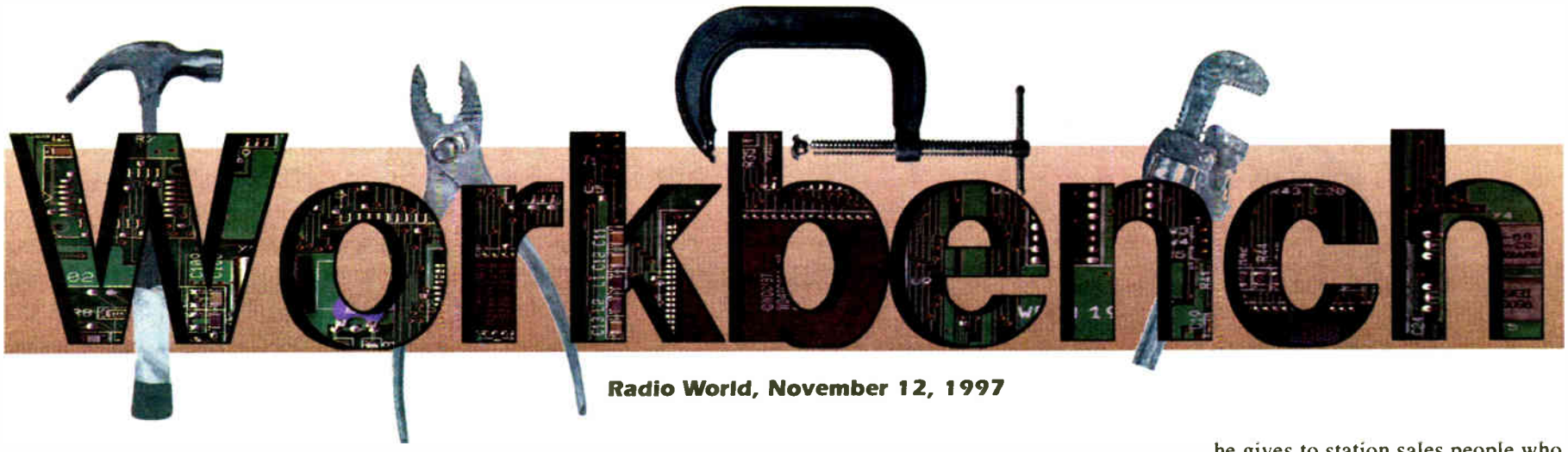


Radio World, November 12, 1997

Tips for a Happier RF Life

John Bisset

The "AM/FM Transmitter Workshop" at The NAB Radio Show provided a number of good maintenance tips.

If you have a Nautel AM transmitter, and repair your own NASM1A Modulators, Manager of Consumer Service Kevin Rodgers stressed the importance of making sure the high current wires are properly assembled on this module.

The proper assembly procedure involves screwing two nuts onto the stud, sandwiching both wire lugs and locking things down with a third nut. If the assembly order is nut-lug-nut-lug-nut, the high currents flowing through the wires will heat the stud, causing a failure.

★ ★ ★

Stuart Peters, manager of RF Services at Broadcast Electronics, recommended keeping filters and heat sinks clean. Dirt and dust combine to reduce the efficiency of the heat sinks, and solid-state devices cannot handle high amounts of heat.

This is especially true for the FM IPA drawers. If you get an over-temperature overload on these drawers, contact BE RF Service for a modification that reduces the raw voltage to the regulator, permitting cooler operation.

In many of the newer solid-state, or solid-state controlled transmitters, a 9V industrial battery is used to hold parameters in memory or assist with start-up after a power failure. Check this battery voltage periodically, and replace the battery annually.

Engineer attendees at the session had their own problems and solutions.

A contract engineer from Colorado Springs was having a problem with a Collins 831-G. The gating cards were misfiring, blowing the filament fuse. The age of the electrolytics is one of the first things to check when it comes to gating card problems. As the electrolytic caps get old, these boards can develop problems, so a wholesale replacement of these caps is warranted.

An owner of a BE 5 kW transmitter experienced the forward power APC "hunting" between 5 and 6 kW. The Automatic Power Controller seemed to go into "spasms" as it searched for the right power level. The fix? Check your audio processor. Some audio processors put out a DC voltage along with the audio. This DC component could be causing the transmitter problems.

★ ★ ★

If you want to put together a transmitter checklist, make sure a working flashlight and fresh batteries top the list. The plug-in rechargeable flashlights are even better; place one inside the door to the transmitter building.

★ ★ ★

When was the last time your concrete floor was sealed or painted? If the answer is "never," concrete dust could be slowly destroying your equipment. A coat of concrete deck paint or concrete sealer will stop the dust problem.

★ ★ ★

If you maintain an old AM site, you probably have RF contactors that use solenoids to switch networks in and out. Kintronic Labs, in Bristol, Tenn., sells a silver-based lubricant for lubricating RF contactors. Reach Kintronic at 423-878-3141; or circle ***Reader Service 146.***

★ ★ ★

An engineer from Florida (the Lightning State!) suggested tying an MOV across the tower light beacon lead to ground after the tower light flasher, to reduce lightning damage to the solid-state flashers.

★ ★ ★

Another tip is to buy a bug zapper for the transmitter building. It's better to have bugs that get into your building end up in the zapper than in your transmitter filter, or worse yet, the transmitter itself. Because summer is over, these zappers will be on sale. Be sure you pick one up!

★ ★ ★

Steve Hamm is a contract engineer who services 14 facilities in a 300-mile radius. To keep things straight, he keeps a notepad at each site. He jots down what he finds and what he does during each visit. This eliminates forgetfulness and provides a written record of your inspection.

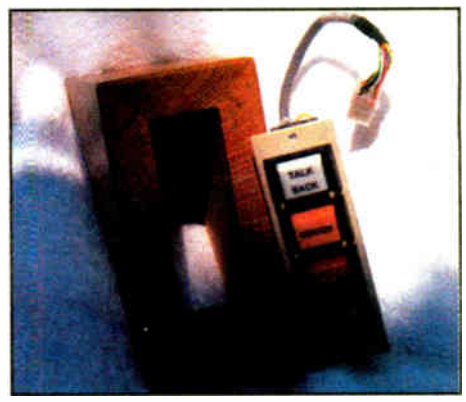
This written checklist can be expanded to include remotes. One engineer told of making up a "who, what, where, when, why, and how" questionnaire that he gives to station sales people who are selling remotes.

The checklist forces them to make sure there are adequate electrical outlets and telephone lines, that the location is not in an area where the Marti won't work, and that contact names and numbers are listed.

Ray Klotz, engineering manager for KOMA-FM in Oklahoma City, one of the panelists for the AM/FM transmitter workshop session, summed up our charge with the phrase, "Communication is our business ... not our policy." As Ray suggested, we do indeed need to turn this around, and developing checklists is the first step.

★ ★ ★

If you're looking for small customized woodworking try TOMAL, a small woodworking shop that can do custom work at reasonable prices. The



Guest Mike Turret

Guest Mike Turret (pictured) runs from $150 to $200 depending on the type of wood: oak, cherry, or your choice. The frame is finished, and rugged. It's glued with wooden splines for durability. For more information, circle ***Reader Service 147.***

★ ★ ★

Here's an interesting problem and fix for older Collins/Continental FM transmitters with driver tubes. A particular transmitter could not maintain power, and the drive to the PA was low.

In checking the transmitter readings, the driver screen voltage was half the normal factory measured value.

On the older rigs, the driver screen voltage comes from the driver plate. Two zeners are used to obtain the screen voltage. If one shorts, as it did in this instance, the voltage is cut in half.

A quick fix, but one that demonstrates the importance of keeping detailed transmitter readings that you can refer to when something goes wrong. Thanks to Richard Garrett of Continental Field Service for sharing this tip.

■■■

John Bisset is a principal with Multiphase, a technical services company. Reach him at (703) 323-7180. Printed submissions qualify for SBE recertification credit. Fax submissions to (703) 764-0751, or send them via e-mail to wrwbench@aol.com

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World Radio History

KEYBOARD CONNECTION

There's Trouble in E-Mail City

Barry Mishkind

For some people, it evokes the silly image of a much-maligned luncheon meat. But for those who depend upon Internet e-mail for communication and business, it is a word usually spoken with anger. Can you say "spam?"

Spam, also known as unwanted bulk e-mail (UBE) or unwanted commercial e-mail (UCE), is similar to the junk mail you get in your regular mailbox. However, unlike junk mail, junk e-mail can be costly to you in several ways. One expense is the time it takes to download and delete it. If you are paying on-line or long distance fees, the more junk e-mail you get, the more you pay.

Open the floodgates

Worse yet for those using dial-up services, including the popular national services, is the way junk e-mail has grown from a trickle to a flood of unwanted items. Increasingly, users are reporting important business messages don't get through because their e-mail boxes are "full" of spam. And, to make the inevitable pun, that certainly puts a bad taste in one's mouth.

Unfortunately, the more you depend upon e-mail for your business, the more likely you are to be attacked by this plague. If you are active on the Internet, posting to Usenet newsgroups or running a website, you are being targeted by a wide range of what the Internet community calls spammers. (To be fair to the Hormel Corporation, which isn't pleased with the appropriation of their trade name, from here on we'll just call unwanted messages "junk e-mail" or "UBE.")

Why are they doing this? What can you do about it? Perhaps we can help in lowering your blood pressure a bit.

Why you get it

When downloading my e-mail this morning, the in box included a dozen letters from *friend@public.com*, *8725319@juno.com*, *gladys@nancynet.com* and several from *nevwest.com*. These messages offered me everything from "millions of e-mail addresses" to "Make Fast Cash" pyramid schemes and graphic porno.

Sound familiar? I didn't ask for any of that. You probably didn't either. So how did it find us?

UBE started out targeting people who showed interest in a product or service. Then a few people smelled a lot of money. After all, e-mail didn't "cost" anything to send. If they could send to every available address, they figured they would catch more suckers.

Special servers were set up to send out millions of pieces of e-mail each day. "Gathering" programs were developed to scan every message in newsgroups, support groups and chat forums for e-mail addresses. Some claim to collect 60,000 e-mail addresses an hour. Others send "test" messages to servers every 10 minutes, seeking new user addresses.

Cyberpromo does this. It is run by the acknowledged King of Spam: Sanford "Spamford" Wallace (sorry, Hormel).

See E-MAIL, page 35 ▶

Radio Reaches Students

NEW YORK Advertisers looking to reach college students should use radio. A new study by Interep Research said radio reaches nine out of every ten college students in the average weekday, 20 percent higher than are reached by TV and 48 percent higher than newspapers.

There are about 12.7 million college students; 61 percent are full-time, according to Interep. The number of students who attend college has been rising consistently; right now, six out of ten high school graduates plan to attend college.

Contrary to traditional opinion, college students are not penniless; 58 percent of part-timers and 23 percent of full-timers work 30 or more hours a week, according to the study.

Students spend more than $96 billion each year, much of which goes towards beer and soft drinks and higher-priced items like vacations, stereos and athletic equipment.

On average, 90 percent of students listen to the radio on any given day, usually concentrating on urban contemporary, CHR/rock, and modern rock formats.

- Advertisers are spending $185 million a year trying to reach college students. Interep offered tips for marketing your station to capture some of those dollar, including:
- Staging a remote or fund raiser at a campus. It blends advertising with entertainment, and is likely to capture a student's attention, as well as promote good feelings toward a brand.
- Co-sponsoring an event with local media at a spring-break location.

Including college radio in your plans.

Industrial Strength Digital Audio Delivery

Digital Audio Delivery systems are now recognized as a must for every broadcast facility. But few systems provide the features, flexibility or reliability required to maintain profitability in this demanding and fault critical application, nor the support mechanism to maintain them.

The ENCO DADPRO32 Digital Audio Delivery System is simply the most powerful On-Air & Production system available. Based on the already widely accepted and mature DADPRO product, but now optimized for the Windows NT® operating system, DADPRO32 is unique in its uncomplicated user interfaces and adaptability to any format, yet harnesses the power and reliability of proven technology.

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- Powerful Production and Call Processing capabilities, including Graphic Cut & Paste Assembly Editing. Automatic Recording features are included for catching network feeds.
- Interfaces to all Music and Traffic Scheduling and Billing systems.
- Features full 32-Bit Processing and True Multitasking capabilities. Many third party programs, such as Multitrack Editors, Wire Capture systems and Word Processors may be directly embedded into DAD, or operated on the same Workstation.
- Inherent support of Global Wide Area Networking, for sharing of data between multiple facilities. Ancillary products are available for Store Forward operations and remote management of unmanned downlink sites.
- Operates on commonly available "off-the-shelf" computer hardware and network architecture, utilizing any of a wide variety of redundancy configurations.
- DAD is an outright purchase, and there are no monthly licensing fees. Free software upgrades are provided for the first year. ENCO technical support is legendary as the best in the business.

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The 16000 Audio Routing System is the powerful new compact switcher from Sierra Automated Systems.

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Completely self-contained, the 16000 handles 32x32 routing in a mere two rack-units. Through a variety of schemes utilizing off-the-shelf, pre-made cable assemblies and cross-connect blocks, system interconnect is now faster than ever before.

This switcher gives you full-system access 'XY' controls; plus a bright read-out for displaying inputs/outputs, and system settings. Source and destination confidence monitoring is available via the convenient front panel speaker.

The 16000 makes everything easy—with programmable salvo switching, stereo linking, PC software control, scheduled event switching, universal serial ports for distributed control networks, and employs the full range of SAS remote control panels.

The 16000 moves with high-octane performance. The control system is versatile and thorough. Quality and reliability are never compromised.

Wired thing... We think you'll love it. For more information about the SAS 16000, please give us a call.

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World Radio History

Beware of the 'Remove' Gimmick

▶ E-MAIL, continued from page 33

Wallace revels in the international attention he gets for hosting hundreds of domains (e-mail servers) spewing several gigabytes of junk e-mail every day. Plus, he teaches his clients how to find you.

The 'Remove' scam

Once companies learn they can make more money by selling your e-mail address to people running other mail-order and pyramid schemes, they take steps to accomplish that while hiding from you. An important tip: Do not *ever* respond as the junk e-mailer asks.

For example, many of the UBEs advise, "If you do not wish to receive more of these messages, just press reply and add 'remove' to the subject line." In fact, Cyberpromo set up a special domain *answerme.com* just to handle such responses. (Another one to watch for is *removeme.com*.) E-mailing these addresses reaches what is called an auto-responder; by sending the "remove" messages you will actually receive *more* unwanted messages.

This pattern has been verified by many Internet users. They set up brand new addresses, and send a "remove" message. Within minutes, these new, never previously used addresses receive junk e-mail.

Just as devious is the "global remove list" run by IEMMC. (IEMMC was set up last May as an alleged e-mail marketing association.) After filling out a form supposedly to guarantee you won't receive unwanted e-mail, *you get more!*

Actually, IEMMC was a sham organization dedicated to gathering e-mail addresses, not removing them. I say "was," because IEMMC's Internet Service Provider (ISP) cut them off in mid-September, along with Cyberpromo and several hundred other junk e-mail sites. Although a court order put Cyberpromo back "on the air" — at least until mid-October — as of this writing IEMMC was not on line.

More unsettling are "web crawler" programs that search websites for "mailto:" If it's on your home page, they'll grab your address. And with the DejaNews search engine, if you've posted to any newsgroup in the last several years, it is possible for your address to be collected. One solution is to use two e-mail addresses: One can be for posting on newsgroups, and the other used privately.

Perhaps after getting UBE, you've considered complaining to the sender. This won't accomplish anything either. The "From:" address headers on UBE are usually non-existent or forged. Your angry response either bounces back or goes to harass an innocent person or provider. Another ploy is to use a real account as a "throwaway," the sender expecting it to be shut down.

So, if you can't "remove" your name, and you can't reach the sender, what can you do?

Positive actions

Systems such as *juno.com*, *aol.com*, *hotmail.com* and *good.net* respond quickly to complaints sent to *abuse@<domain>* and close accounts used by unethical users. However, as noted above, often those accounts are already abandoned as "throwaways."

Complaints to the hundreds of domains run by IEMMC members, including Cyberpromo, Nancynet, *nevwest.com*, *llv.com*, and others, are not read at all. They are deleted upon receipt, *after* they have stripped your address in order to send you more junk e-mail! So, be careful.

You can try filtering; many e-mail readers have this option. My current e-mail reader of choice, Eudora Pro from Qualcomm, features robust filtering that can send UBE directly to the trash bin or to a special folder for later inspection (in case any messages you wanted got caught by your filters).

If you'd like a superb guide on setting filters, visit *www.erols.com/dtoombs/spam.htm*

You can also ask your ISP to block incoming e-mail from known junk e-mailers. Some will, but because junk e-mailers change their domains frequently and bounce UBE through machines all over the world, results vary. The use of forged headers also makes life miserable for the ISPs.

Newsgroup readers may notice "munged" addresses attempting to mislead the address collector programs. *george@there.com* might use a return address of "*george at nospam.there.com*". However, recent evidence indicates stripper programs already understand how to "decode" such efforts.

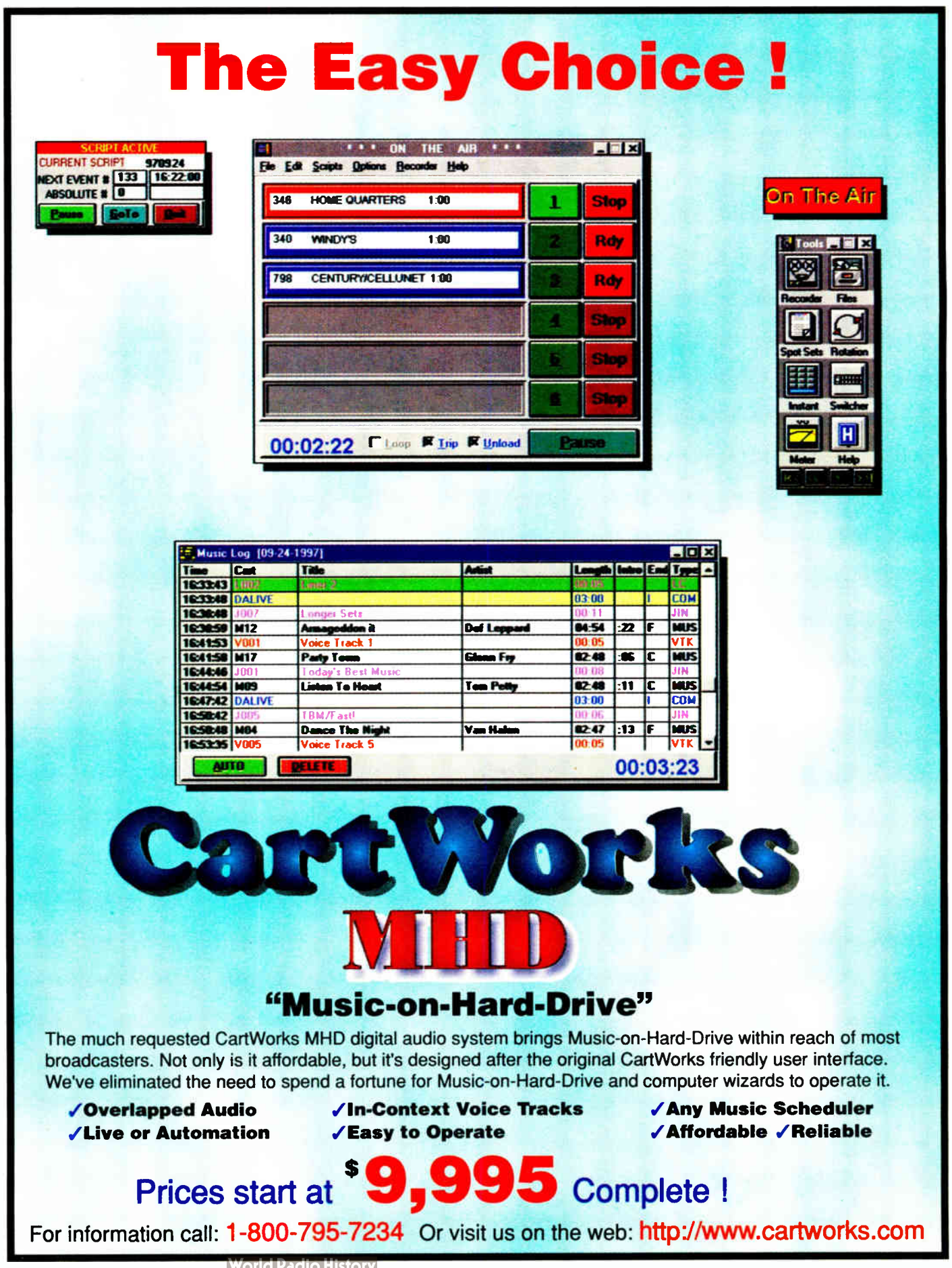
There are several groups lobbying Congress to do something about junk e-mail. However, others fear it will only lead to political "fixes" that turn out to be ineffectual or government censorship.

If you'd like to read more about Internet community efforts to find an effective solution, the newsgroup *news.announce.net-abuse.email* collects hundreds of messages a day, identifying rogue mail servers and offering help in decoding the headers. FAQ (Frequently Asked Question) files show up regularly with information and strategies to keep your e-mail box from being overloaded.

For more advanced users, *http://kryten.eng.monash.edu.au/gspam.html* has information and aids for identifying the source of UBE.

■■■

Barry Mishkind writes from the Radio Ranch in Tucson. E-mail him at barry@broadcast.net *(Junk e-mailers need not apply!) Barry's home page is* http://www.broadcast.net/~barry/



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

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

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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.

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Sony Worldwide Networks
Manhattan, New York

World Radio History

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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.

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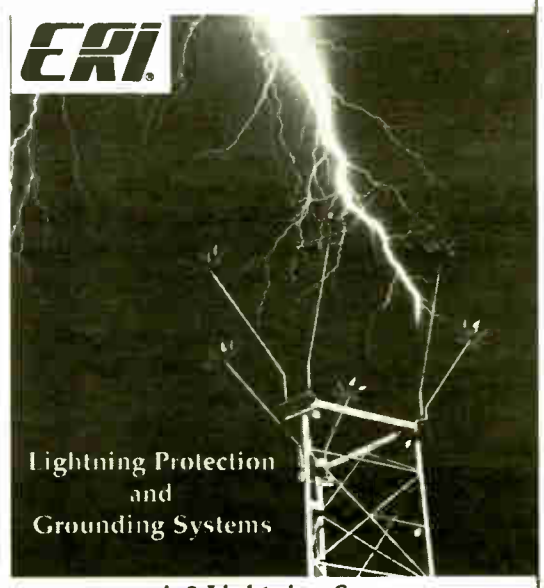

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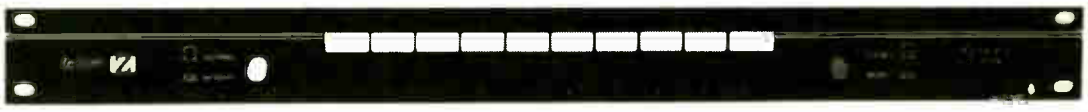

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Harris Broadcast Division Systems Operation promoted **Jay C. Adrick** to the position of vice president. Adrick has been in the radio industry for 34 years and is an active member of the SBE and SMPTE.

Adrick has been with Harris since 1991, the year Harris acquired Midwest Communications Corporation, where Adrick had been an employee since 1978.

Toussaint Celestin has joined **Orban** as product manager for on-air digital delivery systems and will oversee the development and marketing of the Orban AirTime.

Toussaint Celestin

Celestin earned a B.S. in Economics from Georgetown University and has received audio engineering training from the Omega School of Recording Arts & Sciences.

Keith Rovell joined **Shane Media** as a programmer/consultant. Prior to joining Shane Media, Rovell was the programming manager for News-Talk station WASK-AM-FM in Lafayette, Ind. According to Ed and Pam Shane, principals at Shane Media, Rovell has "built a radio station from scratch; conducted demographic research; trained and developed air talent; and developed sales strategies."

CBS Radio announced that Dave Martin has been named general manager of three Dallas stations KOAI(FM), KRBV(FM) and KHVN(AM). Martin is the founder and president of The Radio Consultants, a management consulting firm.

Traugott Keller has been promoted by **ABC Radio Networks** from eastern sales manager to senior vice president, Advertising Sales and Marketing. Prior to joining ABC Radio in 1994, Keller held positions with CBS Radio Networks, WQXR-FM-AM and The New York Times.

You Must Remember This

Flash back to 1981. Things were tough all over. Zenith manufactured the R-7000-2 Transistor Trans Oceanic, the last of its Trans Oceanic series of radios. The series started way back in 1942, with vacuum tube models.

This solid-state model featured 12 frequency bands and was priced at $379.95. Options included a swivel base. Operation required nine D batteries or 110 V.

Thanks to its high-quality parts, this model remains a great performer today.

Read all about this radio and others in the series in "The Zenith Trans Oceanic: The Royalty of Radios," (Schiffer Publishing, Ltd.) by John Bryant and Harold Cones. The paperback is available for $24.95.

Collector Bill Overbeck provided **RW** with this picture and description. Overbeck, president of the Delaware Valley Historic Radio Club, has made every effort to ensure accuracy. Contact him via e-mail at *billoradio@aol.com* or through **RW**.

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World Radio History

BOOK REVIEW

Enjoy This Thorough DA Primer

W.C. Alexander

If you enjoyed my recent series of articles on AM antennas, you will love "Directional Antennas Made Simple" by Jack Layton. He has written a comprehensive "how-to" book that targets chief engineers, technical directors and technically minded owners.

Assuming a basic understanding of electronic principles, Layton, who writes occasionally for RW, takes the reader from the basics of medium-wave vertical antenna theory all the way through directional antenna theory, planning and construction methods, proof-of-performance, and maintenance and repair. Those who read it will come away with a good understanding of the workings of AM antennas.

The basics

The author begins with an excellent explanation of vertical antennas and their electrical properties. He discusses at length such basics as frequency vs. wavelength, angular measure (electrical degrees vs. physical length), velocity factor, resistance and reactance. Layton discusses the self-impedance characteristics of the different types of vertical antennas, along with methods of coupling tower light wiring and other isolated feeds across an insulated tower base.

The book explains simple reactance matches as well as L- and tee-networks in detail, along with the formulas for computing leg reactances and component values based on input/output impedance and phase shift. Layton deals with component types and ratings, giving us a good understanding of the limitations of transmitting capacitors and how to select them for proper current rating.

Layton also describes the relationships between field strength and power, and field strength and distance, including a good discourse on ground conductivity and its effect on the inverse distance field of an AM station. He includes an explanation of the vertical radiation characteristics of different electrical heights of radiators, showing why longer radiators generally produce higher groundwave field strengths.

DA basics

The text then moves on to directional antenna basics, starting with the purpose of a directional antenna. Layton defines the terminology used in discussing directional antennas, along with the symbols commonly used to represent them. He describes the effects of phase and magnitude, and he gives simple, easy-to-understand examples of vector addition to help the reader get a grasp of the way the radiated fields from array elements combine at a distant point to produce a desired field.

Some of the great mysteries of AM directional antennas, such as driving point impedance mutual coupling and negative power flow, are explained here, in a way that is easy to understand. Charts help you calculate mutual impedance; formulas help you calculate driving point impedance. The author helps the reader work through the examples step by step.

The graphics would benefit from more professional preparation. But the content is excellent.

DA phasing and coupling systems are described in detail, and the purpose of each element in the system is defined. Most of the common types of power divider and phase shifter circuits are presented, along with a discussion of the benefits and drawbacks of each. The phase shift of each part of the system, including transmission lines, is shown, giving the reader a good understanding of the effect of each part of the system on the phase and amplitude of the signal as it passes through on its way to the radiating elements.

Layton touches on vertical plane radiation patterns, graphically illustrating how the radiation pattern changes at different angles above the horizon. He explains that it is almost impossible to actually measure the radiation pattern at angles above the horizon, so the FCC assumes that if the correct pattern is produced on the horizon, the vertical plane pattern is correct as well.

Layton wraps up his DA theory discussion with a look at multiple patterns from the same array, examining switching techniques and shared coupling networks.

Construction

One of the best parts of this book is the section on building directional antenna systems. The author takes the prospective builder through every phase of the project, from site selection to final tune-up.

Layton details the design and installation of the phasing and coupling system. He discusses sampling systems, along with sample lines, transformers and loops. He deals at length with proper loop orientation, something I have seldom seen discussed.

Layton discusses the various aspects of transmitter building design, including physical layout, electrical considerations, HVAC issues, tower lights and control

See BOOK, page 43 ▶

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World Radio History

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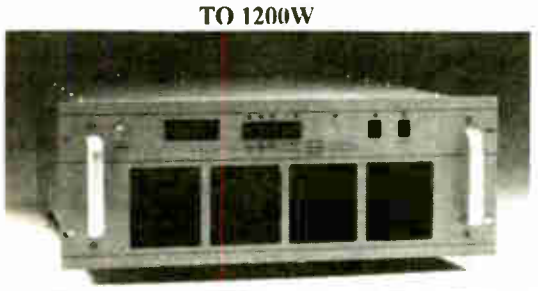

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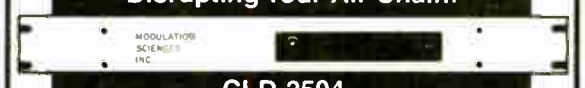

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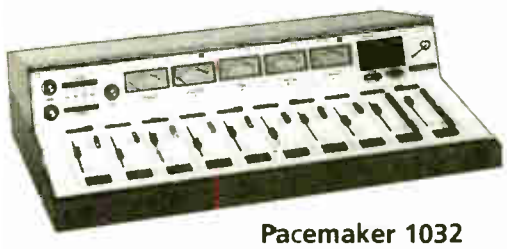

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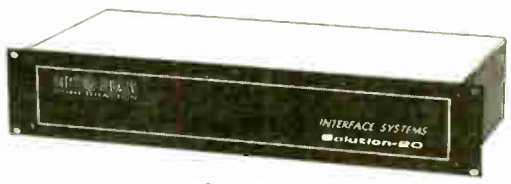

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World Radio History

Bing Crosby Made Radio History

William J. Ryan

The love of one Hollywood superstar for his ranch and his dislike of the technological inefficiencies of broadcasting, helped speed the acceptance of audio tape in broadcasting.

Bing Crosby saw audio tape as a springboard to a happier personal life, believing that if he could tape his weekly shows in advance, he would not have to stay in Hollywood during the fall and winter, broadcasting his highly rated "Kraft Music Hall" on NBC.

Crosby also had a strong distaste of being forced to perform a repeat broadcast of "Kraft Music Hall" for the West Coast; he wanted to do one show and call it a day.

Home on the range

Crosby cherished the ranch he owned in Elko County, Nev., which was far from Los Angeles.

When it became clear early in 1946 that magnetic tape recording might be feasible, Murdo Mackenzie, the technical producer for Crosby, picked up on it. A demo of the new machines convinced Crosby and Mackenzie, and the rest is history.

In his book "None of Your Business," Carroll Carroll, who was Crosby's writer and the ad agency man for Kraft, wrote that Crosby acquired a financial interest in "a clever little item, now called audio tape, that a couple of thoughtful GIs brought home with them from Germany."

Carroll wrote, "It was Bing, with his stake in tape, who used the muscle of his box office power to force it onto the network-dominated broadcast industry." Crosby had hosted the Kraft Music Hall for 10 years, beginning in 1936.

Kraft made a huge but unsuccessful effort to keep Crosby, even offering Kraft stock, "a new ploy at the time," according to Carroll.

Neither CBS nor NBC, Crosby's network, would play recorded programs. That was their policy, and they stuck to it. So the Crosby people went out looking for sponsors and for a network that would allow him to record. "He was then in a position to offer this show to any network that would break down and allow this new form of recording to breach the rule that all its broadcasts must be live," Carroll wrote.

"The American Broadcasting Company, once the Blue Network of NBC, eager to do anything to put itself in contention with the two older nets, bought Crosby's idea in order to get Bing," Carroll wrote. "By so doing it launched audio tape and changed the face of radio broadcasting."

This was a huge prestige coup for ABC. Beginning in the fall of 1946, electronics giant Philco became the new Crosby sponsor.

The familiar "Kraft Music Hall" became "Philco Radio Time," but with the same cast, same orchestra and guest stars.

A-B-Cs of audio tape

One of the ABC engineers who worked on the Crosby show was Bob McGaughey. The Crosby show was recorded for part of the first season on ABC, but it was on a multiple disk and segue arrangement according to McGaughey.

. McGaughey played back the show, which had been recorded in sections on 16-inch disks.

"They started on the outside of the disk and recorded three to four inches in toward the middle before stopping, with the next disk already going so there would be an overlap and no loss of material," McGaughey said. "They were cut at 78 rpm to preserve the music quality. This made for a stack of disks five to six inches high, which I had to handle."

Looking on

"There was a gallery of people in an audition studio behind a glass window who watched every move I made during the playback process," McGaughey recalled.

He said that even though the show ran on the ABC network, it was produced in what was called the "Intercept Studio" at NBC. ABC apparently leased the facility because it had no suitable studios of its own.

"NBC engineers also did the cutting of the show I played back on ABC because they had a large bank of Scully lathes," McGaughey said.

McGaughey said that after the Crosby show completely switched to audio tape he was the first person to play the magnetic tape for the network.

"We had four of the big Ampexes," McGaughey said, adding that the machines were approximately 4-feet tall, 3-feet deep, and 5- to 6-feet wide.

"In the beginning we used the red German tape because the first 3M would not lie flat," he said. According to McGaughey, the original Ampex machines did not use supply and take-up reels, but, rather, large horizontal plates on which the tapes were wound from the center hub, necessitating their lying flat.

As new and more satisfactory tapes were developed, and Ampex made improvements on its machines, NBC and CBS finally agreed that recordings of network quality could actually be made.

ABC managed to hang onto the Crosby show for a few seasons before Bing went to CBS. By this time, magnetic tape recording was accepted throughout the broadcast industry as the standard, thanks in large part to Bing Crosby.

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World Radio History

Directional Antenna Tutorial

▶ BOOK, continued from page 40

circuits. He even offers tips on selecting a contractor, raising the issues of workman's comp and liability insurance.

Tower installation, including lightning protection, lighting, static discharge protection, guy wires, top loading and safety, is discussed in detail. Also presented is the proper method of installing transmission lines, both underground and on the tower.

The text explains ground system installation, and offers many tips on how to get the most out of your ground system. The proper installation of strap and connection to antenna tuning units and the like are dealt with, too.

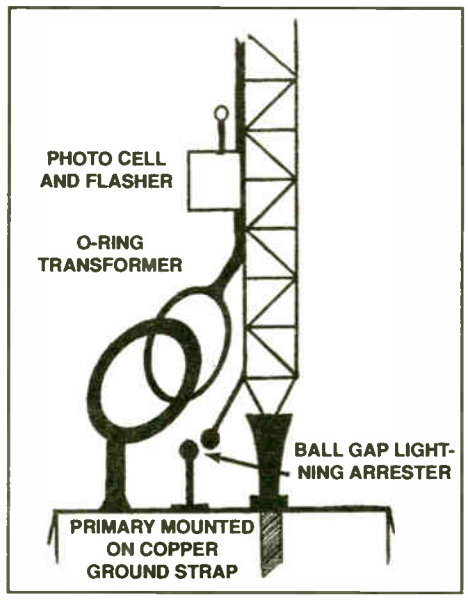
The reader will have a good grasp of the scope of an AM directional antenna construction project. This is a must-read for anyone contemplating building or overhauling such a site.

The following chapters deal with proofs-of-performance, both directional and non-directional. Methods of making good measurements and keeping good records are presented. Proper point selection, map marking and close-in measurements are examined for the reader.

Included are methods of detuning unused towers during the non-directional measurements, as well as "jury-rigging" a directional system not so equipped for non-directional operation.

Graphical analysis of measured data is explained, presented with several examples of inverse distance graphs of measured data with measured conductivities drawn. Layton does a good job of removing the shroud of mystery from this often misunderstood aspect of field strength measurement.

He also deals with initial array setup and final adjustment. The author starts with a simple two-tower example, then builds upon that to show the proper method of adjusting a larger, more complex array. No written instruction can prepare someone for the intricacies of directional antenna adjustment, but Layton lays a good foundation that presents the principles involved.



Details of the O-ring Lighting Isolation Transformer

The final chapter deals with preventive and corrective maintenance, presenting tips on how to keep a directional antenna system in top condition.

Partial proof measurements are examined, with the reasons such measurements might be required and the proper method of making them. The procedure for monitor point relocation is explained, along with methods of attaching other antennas on array elements. Techniques for detuning reradiating (parasitic) objects are presented, along with the circumstances under which such detuning may become necessary.

This book is self-published and is not slick by any means. It comes bound with a black plastic spiral, and looks more like a seminar handout than a book. The graphics and illustrations, some of which are hand-drawn, would benefit from color and more professional preparation. But the content is excellent.

"Directional Antennas Made Simple" is full of illustrations, charts, graphs and formulas that make it easy to understand the material presented. The book does not read like a typical text; it is easy to read and informative. As technical reference books go, it is a "page turner." I have been designing, building and maintaining directional antenna systems for many years, and I am glad to add this useful volume to my library. Anyone who is involved with AM directional antenna systems should have a copy.

The book is self-published by Layton Technical Services for $39.95 plus $5 for shipping. Call (412) 942-4054 to order with check or money order.

■■■

Cris Alexander is director of engineering for Crawford Broadcasting. He recently concluded a year-long series of articles in RW on the fundamentals of AM transmission systems.

The following is an excerpt from "Directional Antennas Made Simple" by Jack Layton.

"It's relatively easy to visualize how signals from towers in a directional antenna system cancel or add to form the pattern. However, what is behind the gain in field strength over a single element? A 90E tower energized with 1 kW will produce an inverse field of 312 mV/m at 1 km. This same tower energized with 500 watts will produce .707 of this value — or 220.5 mV/m at 1 km.

"Now, take the two towers in a 1 kW DA system, each energized with 500 watts. On azimuths where the individual signals are totally in phase and add together the inverse field will be 441 mV/m. In a four-tower array, where each is energized with 250 watts, each element produces 156 mV/m at 1 km. On azimuths where the individual signals are totally in phase and add together, the inverse field will be 624 mV/m."

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World Radio History

ROOTS OF RADIO

Perils of Early Phono Cartridges

Ronald Pesha

Home phonographs remained mechanical devices with spring-driven turntables and acoustic reproduction years after record companies had introduced electrical recording.

Those who were around in 1925 can recall the occasional radio station practice of placing a microphone in front of the horn of a gramophone. While domestic penetration of electrical phonographs lagged (due to the Depression), commercial facilities quickly developed electronically amplified reproduction of records.

Engineers adapted microphone design to phono pickups. They experimented with variable resistance schemes, like carbon microphones; photocells or "electric eyes"; and capacitor or "condensor" pickups. Remember the much-later Weathers pickup of the 1950s, with its then-astonishing 1-gram stylus pressure?

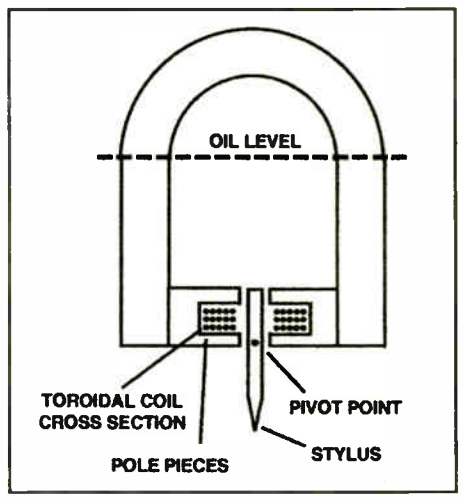
Perhaps most prevalent, then as well as now, was the dynamic magnet and coil. The horseshoe magnet in the drawing is not a mere schematic representation. The manufacturers used a real horseshoe magnet, three or four inches high!

It looks as if they began fabrication by buying horseshoe magnets from the local science store. Forget the weight; even with a tonearm counterweight, stylus pressure was around five ounces. Ounces, not grams.

Operation is obvious. The pivoted iron stylus arm is actuated by the stylus tip and varies the magnetic flux, generating an electrical signal in the coil. Note that pivot point. The stylus pivots from side to side, but cannot move up and down. There weren't any stereo grooves in those days!

The actual stylus usually was steel. The abrasive, added to 78 rpm shellac records, ground the uncertain tip to fit the groove. The operator needed to operate the setscrew to change the stylus for every four-minute side. But did anyone really change the stylus that often, even with 1,000 styluses priced at $1.25?

The designer controlled unwanted resonances with rubber blocks, placed between the stylus arm and the pole pieces. But "high-grade" sound systems demanded a superior damping system, and the manufacturer canned the magnet and coil assembly in a leakproof case filled with oil. An oil-filled phono cartridge! We hope it was leak-proof.



Early Phono Cartridge

Professional versions of these dynamic pickups were wound with relatively few turns of wire to feed a long 500 Ω line. The then-ubiquitous input transformer for broadcast gear stepped up the impedance and voltage to feed a vacuum tube grid. High impedance versions were wound with several thousand turns of wire (more weight on the stylus), but with a Z around 20,000 Ω to feed a vacuum tube grid directly with 1 to 5 V. That's Volts, not Millivolts.

Pickup variety

The book describing these pickups, an early edition of Ghirardi's "Radio Physics Course," shows a variety of ways to feed the pickup output to amplification. Some show a potentiometer connected directly across the pickup coil, while other designs feed an audio amplifier grid or, via a selector switch, the grid of an AM receiver detector tube grid. None show a provision for the bass boost necessary with magnetic pickups.

Did the engineers of the day fail to notice that lows were severely attenuated? Or did the brightness at the upper end sound so much better to 1920s ears than the old acoustical reproduction? One two-stage push-pull output audio amplifier design (and those UX-224 tubes predate even me) does include a "tone control" with a series capacitor wired across the audio to reduce the highs, a scheme still prevalent in cheap radios and music reproduction systems even today.

Perhaps that taming of the excessive highs was a blessed relief, especially after a few scourings of shellac record grooves by a 5-ounce stylus tip.

■■■

Ronald Pesha is Associate Professor of Broadcasting at Adirondack Community College, Queensbury, N.Y. Reach him at (518) 743-2200 (ext. 567) or by e-mail at peshar@acc.suny-acc.edu. *Or fax him at (518) 745-1433.*

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World Radio History

Running Radio

Radio World — Resource for Business, Programming & Sales — November 12, 1997

All-Female Radio
Page 55

Jazz Seeks Commercial Foothold

S.D. Yana Davis

Although jazz recently has lost ground on noncommercial stations, the attractiveness of professionally-produced overnight jazz services may work to keep traditional and mainstream jazz alive and well. Traditional and mainstream jazz also have found a niche on successful commercial stations that program smooth jazz.

Phoenix feels the heat

KJZZ(FM), a noncommercial station in Phoenix, axed midday jazz programming in August 1995, in favor of an NPR talk package that includes "Talk of the Nation," "The Derek McGinty Show" and "Fresh Air." (See **RW**, Sept. 3)

Scott Williams, KJZZ program director, said KYOT(FM) came into the market with a 24-hour smooth jazz format. Consequently, KJZZ lost midday jazz listeners wholesale to KYOT, because "they could get jazz there 24 hours a day, without having to worry about interruptions from NPR news."

The net effect of the change was that many NPR news listeners stayed with KJZZ through midday, even as jazz listeners switched to KYOT.

"We're raising three times as much money now (during on-air fund drives) as we were toward the end of playing jazz midday," Williams said.

At WRTI(FM), Philadelphia, a public station licensed to Temple University, Program Director Chuck Miller said that the recent decision to drop jazz during midday and replace it with classical music was prompted by a combination of factors.

"WFLN, the classical station here, folded," Miller said. "So the university administration decided to pick up classical music, among other things, to enhance the university's image in the community."

And, Miller said that coming in as program director just five days

See JAZZ, page 52 ▶

ADVERTISER PROFILE

Moto-Photo Pictures Radio Rewards

Claudia Tucker

When a national corporation leaves discretion for advertising expenditures to its individual franchises, how and where does radio fit in? Moto-Photo offers a case study.

Moto-Photo, Inc., invested $7 million dollars this year in advertising, which included print media, direct mail, point-of-purchase advertising, and radio.

Kathy Drury

Most Moto-Photo advertising, including radio campaigns, is created by Freedman, Gibson & White, Inc., of Cincinnati.

Vice President of Marketing at Moto-Photo, Kathy Drury, said radio is a great way to build brand awareness, but it has one major obstacle: It's difficult to see a short-term correlation between radio advertising and sales.

"With print advertising or direct mail, our franchise owners can hold a stack of coupons in their hands and see exactly how much response they got from a given ad," Drury said.

"Justifying the expense of radio advertising is more difficult because assessing the response is more difficult. Even when owners run radio campaigns that say, 'Say you heard it on WXYZ radio station and take 10 percent off,' they're still not sure how many people they reach."

Measured awareness

Drury said Moto-Photo is conducting more awareness research to measure response to radio advertising, but she had a tip in the meantime for radio salespeople.

"Radio station advertising staffs could sell us more air time if they could help us better determine the effectiveness of

See MOTO, page 48 ▶

RADIO BUMPERS

Hooray for Hollywood — in Indiana?

WHLY(AM) in South Bend, Ind., does things its own way, starting with promotional window decals rather than the traditional bumper stickers.

Three years ago the station switched to an MOR format and took on the designation "Radio Hollywood."

"We played so many songs from Hollywood movies and songs from performers associated with Hollywood that we decided to adopt the name," said Mike Shannon, operations manager. The station logo incorporates palm trees and the famous letters, but the letters in the logo are "a bit bouncier" than the actual letters on the Hollywood hill, Shannon said.

How does your bumper sticker convey your station's personality? Send us one along with an explanation, to: Radio Bumpers, P.O. Box 1214, Third Floor, Falls Church, VA 22041.

World Radio History

Circle (78) On Reader Service Card

NEWS ANALYSIS

The Next Broadcast Network?

Alan Haber

The future of webcasting and its role in radio have generated plenty of guesses and opinions. As we have already reported in **RW**, webcasting was a topic of debate at this fall's NAB Radio Show. In some ways, one headline session we attended demonstrated the challenges facing participants in this fledgling medium.

The room was packed for a session called "Broadcasting on the 'Net: Is Radio Ready?" But although brimming with solid cyber-information, the get-together was in some ways more a case of preaching to the choir than trying out new voices.

When Intervox President and panelist Peggy Miles asked how many people in the audience were with radio stations that were already on the Internet, about half the hands went up.

While this supports the argument that there is a fairly strong movement of stations looking to extend their reach onto the Internet, it also begs the question of whether planners of conventions should divide this kind of session into two versions, one for webcasting veterans and another for neophytes.

And what about "webcasting"? The session title contained the word "broadcasting," even though webcasting has been, for better or worse, been the accepted term to describe the act of putting a station's signal on the World Wide Web. The question of whether stations are "broadcasting" or "webcasting" when they do so has not yet been answered. It must be, if stations are to make a business out of this. Remember that Microsoft is trying to steer the various webcasting players toward a standard for Internet audio, a big step toward mass acceptance. The less confusion, the better.

Underlying message

For now, we'll stick with the term "webcasting."

How will radio stations make money on the Internet? What are the business models for doing so? Miles identified three: selling "eyeballs," selling intellectual property and selling products or services directly to end-users, possibly in a pay-per-listen download manner.

How will the next cyber-innovations affect the cyber-activities of radio stations? Is there room in the world of "push" for stations to have their own "channels" and bring their programming to listeners? Does radio even have a place on the Internet?

These and other questions remain unanswered in these early days of webcasting. The underlying message of this session seemed to be: "Stay in there, keep swinging."

At the end of the third quarter of 1997, there were 729 stations doing just that, according to the BRS Webcasters Directory. Taking into account Miles' comment that there has been an increase of 1,100 percent in the number of webcasters in the past year, the possibilities are strong.

Progressive Networks General Manager of Platform Development and session panelist Russell Braun upped the BRS number when he said that there are more than 1,000 radio stations broadcasting on the Internet, including those that have committed to doing so with RealAudio but are not on line.

The information presented at this session was valuable, although a bit obvious at this stage of the webcasting game: Most stations are using either RealAudio or Microsoft NetShow to get their signals on the Internet; the number of simultaneous listeners varies (as many as 50,000 seemingly are possible with RealNetwork from RealNetworks, the former Progressive Networks); and so forth.

Legal issues

Neal Friedman, an attorney with Pepper and Corazzini in Washington, ran down some of the legal issues affecting webcasters (stations don't need licenses from the FCC to go on-line — yet, he said, to the delight of the audience). He stressed the importance of registering a station's trademarks, getting electronic rights for graphics reproduced on a station's website, and getting ASCAP and BMI licenses for playing music on the Internet.

Microsoft NetShow Product Unit Manager Jim Durkin said his company believes the Internet is the fourth broadcast network, and asked if they could afford to not be there early.

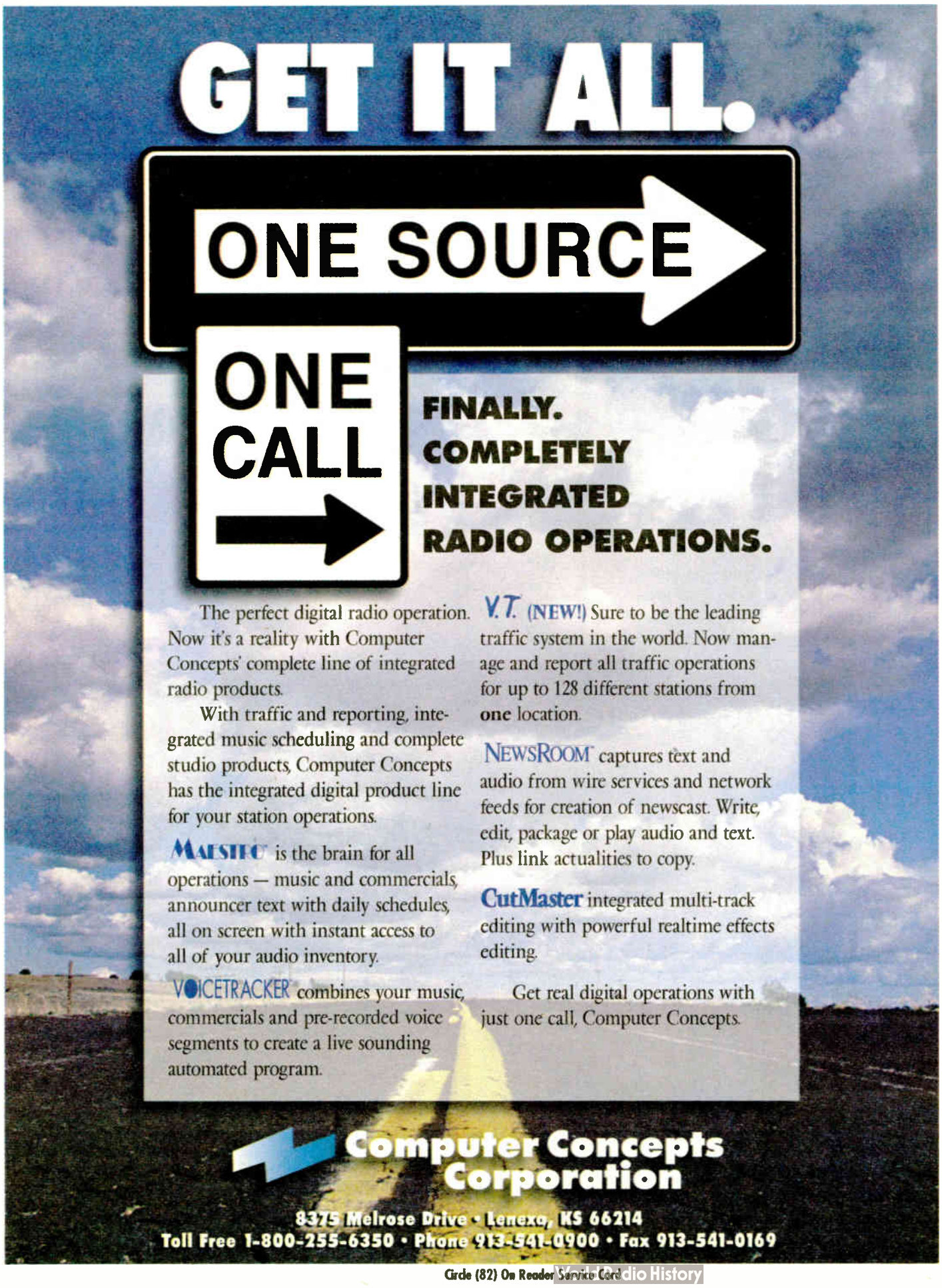
He talked about the growth of technology in the last 12 months, i.e. better audio quality and audio compression, and the rapid growth of "earballs." He predicted better audio codecs, multicast network proliferation and growth of sub-PC "earballs" tuned to the Internet through such options as WebTV.

Greater Media Director of Marketing and Promotion Ted Kelly suggested that programs could be tested on the Internet first and then broadcast over the air. Kelly also suggested that the Internet is good for AM stations that can't get their signals into office buildings.

In the end, stations must feature compelling material on their websites. Miles made this point as the session came to a close, and it is without a doubt the best piece of advice attendees could have taken home with them.

■■■

Alan Haber is editor of Tuned In magazine and a contributor to RW.



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Regional Spending Strategy Works

▶ MOTO, continued from page 45

a radio campaign. Help us justify using radio to sell our services and products."

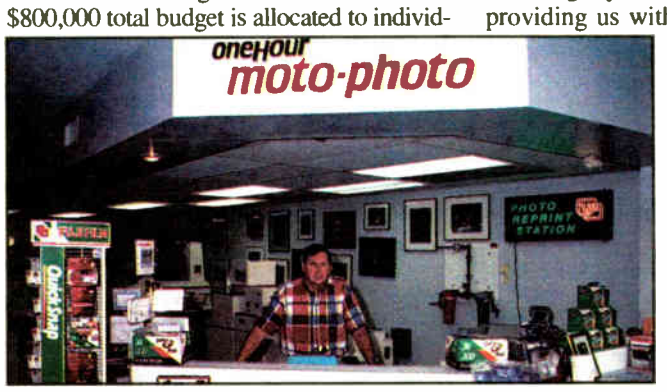
Moto-Photo targets consumers aged 25 to 54 with a relatively high education and an income of more than $40,000. The company looks for stations with the same target audience.

It works in D.C.

Each region decides individually how much to spend on radio advertising, or whether it wants to use radio at all. As a result, money spent on radio varies widely by region.

Moto-Photo's Greater Washington region allocates roughly 40 percent of its total $800,000 advertising budget to radio. Approximately $350,000 of the total advertising budget is spent by the 42 Washington franchises working together in a co-operative. The co-op budget allocates about $300,000 for radio ads, $25,000 for yellow page ads and $25,000 for special events.

The remaining $450,000 from the $800,000 total budget is allocated to individual franchise advertising budgets and generally is used for print ads, public relations, networking and "street fighting" (essentially leveraging ad dollars with tie-ins to other businesses and corporations.)



Moto-Photo Franchise Owner Michael Carlin

"Our co-op has used radio advertising for about eight years. It's been very effective in providing us with a vehicle to gain name recognition and inform consumers about our excellent products and services," said Richard Schuman, area developer for Moto-Photo. "To grab a consumer's attention in print ads, you need to offer significant discounts. That's not necessary with radio ads. We get the opportunity to explain that there's a difference between us and our competitors without needing to reduce the price of products and services."

The Washington region targets an audience mix of 60 percent women and 40 percent men.

In contrast, Michael Carlin, who owns the only franchise in Moto-Photo's Newport, R.I., region, has a difficult time justifying the expense of radio advertising. Carlin said radio may have more impact than print ads, but with an advertising budget of $15,000 to $17,000, he does not use it frequently. To test the waters, he first bought 10 spots to sponsor a Christmas concert in December 1996. His second radio campaign, in the summer of 1997, was prompted by special circumstances.

"A film was being shot on location where my franchise is located and it was having a negative impact on all the businesses in my area," Carlin said. "For six weeks, access to my franchise was blocked about six hours a day and my sign was removed. The community was split on the issue, and I was getting negative publicity for wanting to impose a few limits on the film crew. I wanted to present my position so I bought air time on WADK 1640 AM. This station has a lot of listeners because it has news, talk, and smooth jazz. I think the ads helped."

Carlin also spent $4,000 to run a 200-spot campaign through June, July and August this year. The commercials included a statement about the franchise and its services, featured photography tips, and offered giveaways specific to Moto-Photo, such as wedding package promotions.

"Radio advertising is expensive for a business of my size, but if I can get spots aired year-round that I can afford, I'll use it," Carlin said. "Also, if I was in a region with other franchises where we could share the cost, I'd also be more likely to use it."

Carlin is looking into live remotes tied to specific events, such as Newport's Christmas 1997 Concert and Winter Festival.

Carlin agrees with Drury that it's difficult to track the response generated by radio advertising, but feels it would be less difficult with an event-oriented remote.

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- *Annual Corporate Sales:* $140 million. (Does not include franchise-level sales)
- *Annual advertising budget:* $7 million.
- *Advertising agency:* Freedman, Gibson & White, Cincinnati, Ohio
- *Mission statement:* Moto-Photo shall be the premier franchiser and specialty retailer of high-quality imaging products and services dedicated to enhancing our customers' enjoyment of their imaging experiences better than any other provider.

The Moto-Vulture Spot

Announcer: And now, world renowned photographer Nathan Broken-Burrough for Moto-Photo ...

Sound Effects: Desert winds

Nathan: Welcome to the Kalahari Desert, where today I hope to photograph the many lifeforms that call this inferno "home." I will then rush my film to One-Hour Moto-Photo for prints in *my* choice of sizes and finishes. Moto-Photo can also restore old photos, take passport photos, preserve photos on shirts or mugs, even make photos from photos without a negative!

And just as Moto-Photo has more choices than you'd imagine, the desert has more inhabitants than you'd imagine. Several vultures are now circling overhead and look — a Narcoleptic Sand Fly has just landed on my hand! A single bite from this tiny insect can put a camel to sleep for weeks. Fortunately for me, they rarely ever feed on human fl—

Sound Effects: Silence, then a snore followed by a vulture's cry

Announcer: You don't have to travel the world to work world-class wonders with your photos ... just head to Moto-Photo.

Insert: Here's your chance to become a world traveler! Stop by any Metro area Moto-Photo store through September 13th, and register to win a Caribbean Cruise for two! No purchase necessary — enter today.

Announcer: Moto-Photo *(sound effect:* motorized camera click). Where the experience makes the difference.

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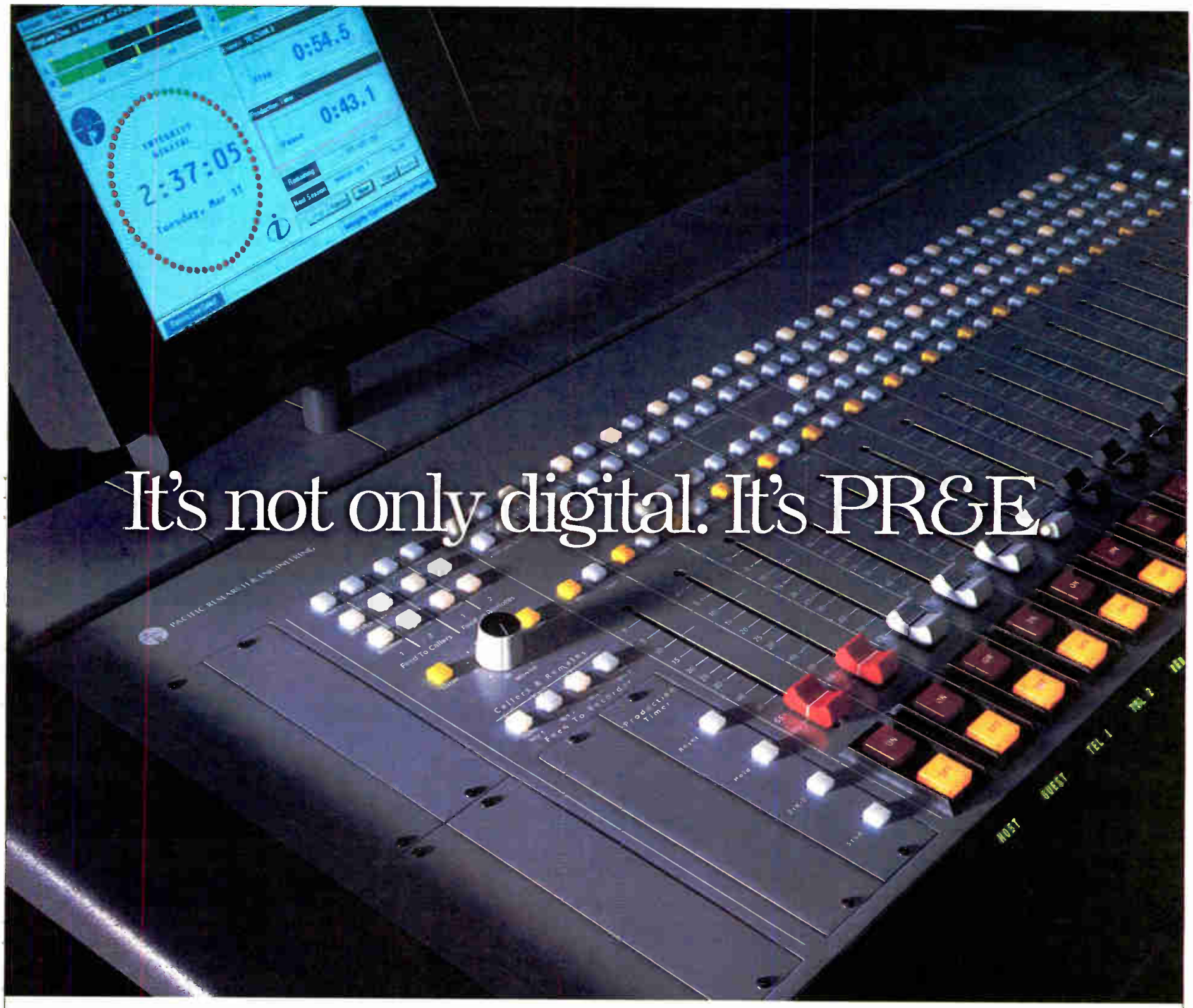

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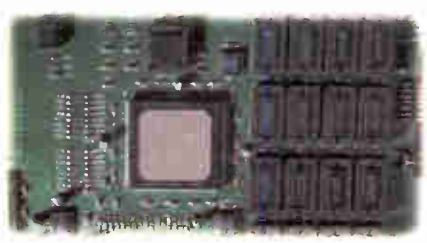

Integrity uses an array of state-of-the-art floating-point digital signal processors to perform its mixing, routing and other functions.

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World Radio History

Nature's Fury, on Your Website

Peter M. Zollman

The next time a tornado touches down in your area or a hurricane blows through, you'll have more than your tower and transmitter to worry about. If your station has developed an effective and meaningful Web presence, you will have to pay attention to servers and software as well.

Listeners who have come to rely on your website will visit it in times of a crisis. Your website is a signal that reaches farther than your AM or FM signal; it reaches around the world.

Develop a plan

Just as you have, or ought to have, a disaster-recovery and management plan for your on-air operations, now is the time to plan for maintaining your website.

Of course, if your website is just a peripheral part of your station operations, this article isn't for you. But if you're serious about making your website an important element for your listeners/users, advertisers and overall profitable station operation, these are important issues.

"An on-line site is only one element of covering a disaster, but you have to be prepared in all areas," said Paul Skolnick, a broadcast consultant based in Belleaire Bluffs, Fla., who works with stations to develop, review and implement disaster preparedness plans.

"It's absolutely important that every station plan, beforehand, what they are going to do, how they are going to do it, and why they are going to do it, when a big story or a disaster like a hurricane or earthquake hits," Skolnick said.

WCCO(AM) and WCCO-TV, the CBS owned-and-operated stations in Minneapolis, had two huge advantages in developing coverage of the 1997 spring flooding in Minnesota and North Dakota.

"The National Weather Service had been giving media the heads-up early on. ... We started planning for the inevitable," said Jay Maxwell, managing editor of the WCCO website. "We tried to put together a package that was complementary to the outstanding coverage we did on the TV station and the radio station. We wanted to ... play to our strengths, use the rest of the Internet and integrate that information into kind of a one-stop package on the Web. We brainstormed and came up with information we thought our viewers (and listeners) would want."

Websites can be an afterthought and a toy, or they can be a crucial part of station operations.

Happily, WCCO's Internet servers were high and dry during the flooding.

Off-site news

But those at the Grand Forks Herald, the newspaper at the heart of the North Dakota floods, were not. The newspaper offices were flooded out, and its reporters, editors and advertising personnel began working off-site.

The corporate owners of the paper shipped in laptops with the software needed to update content on the site. The primary servers were in Virginia, so the paper did not have to worry about electricity, network connectivity or other technical computer issues.

Whether it's a natural disaster (hurricane or earthquake) or a man-made one (plane crash or explosion), your website may become the instant focus of worldwide attention by people seeking news and information. Internet traffic will soar, advertisers will call to spend money on line, and you will put the "service" back into your community service obligation; only this time, you'll be serving a local and a global community.

Websites can be an afterthought and a toy, or they can be a crucial part of station operations. If your site is an afterthought, ignore it during a disaster and focus on your on-air efforts and services. But if your website truly is integral to your audience and to your business, plan in advance to prove it when your station is in a crisis mode.

■■■

Peter M. Zollman (pzollman @aol.com) is a consultant in interactive services. He is author of "Interactive News: State of the Art," published by the Radio and Television News Directors Foundation.

Take This 'Crisis Quiz'

- Have you arranged for an off-site backup server, preferably one that's out of town, that can mirror your site in case your server fails?
- Does your station own, or have access to, a laptop computer that can be used to update your site's content remotely for a few days if you have to move off-site?
- Has your news or programming staff considered what information to put on your website in case of a disaster, and how to keep it updated to the minute?
- Have you developed advance material for potential disasters? This material could be sponsored by an advertiser.

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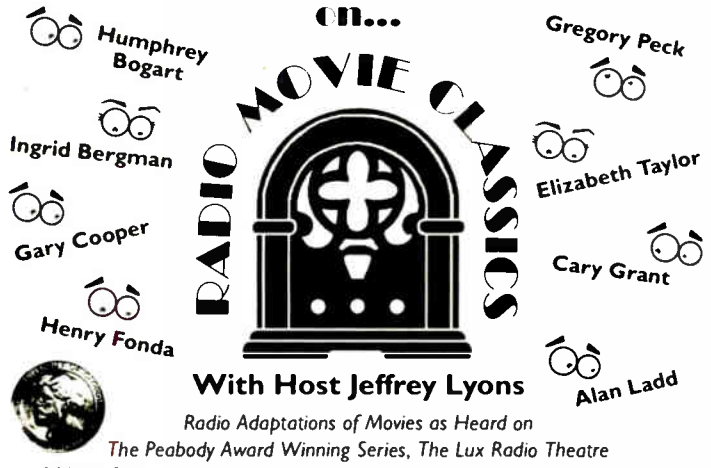

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World Radio History

'Noncommercial Format' Evolves

▶ JAZZ, continued from page 45

before the format change on September 15, he "couldn't defend" WRTI's midday jazz format based on audience numbers or music selection, mostly done by Temple University student announcers.

"There are niche formats in jazz," Miller said, referring to the way WRTI student DJs habitually mixed traditional and other selections within the same sets. "You just can't follow Duke Ellington with Spyro Gyra and expect to keep the listener."

"" PRI Public Radio International®

But while midday jazz is becoming a thing of the past on public radio, overnight services are thriving. Both "Jazz After Hours," a weekend overnight service from Public Radio International, hosted by Jim Wilke, and "WFMT Jazz Satellite Network," with seven nights weekly of mainstream jazz, hosted by veteran jazz programmer Bob Parlocha, have dozens of affiliates.

Affiliate boom

The WFMT service, which debuted only last April, already has 65 affiliates. All are noncommercial, although the "Jazz Satellite Network" is available to both commercial and noncommercial stations.

"I was surprised how quickly we reached (that number)," Parlocha said. "Public radio looks to be the last bastion of mainstream jazz. This is the niche for it. This is the place it will flourish."

However, Wilke, whose show has been distributed nationally for 12 years and is heard on 50 noncommercial stations, was not as enthusiastic. "I saw some research recently from PRI that jazz listeners are not big contributors," Wilke said, referring to noncommercial stations' dependence on listener donations for large shares of station revenue.

Wilke said that this was probably behind the decision of stations such as KJZZ to go with NPR news and talk exclusively during weekdays from morning drive through afternoon drive. "The money (from listener donations) is really in news and information programs. Talk radio is more foreground than jazz, or other music for that matter, and creates a more involved audience."

Commercial alternative

But traditional jazz may have a future on commercial stations as well, thanks to the successful principal format of the stations that carry traditional jazz as niche programming.

"Legends of Jazz With Ramsey Lewis," a two-hour weekly program produced by United Stations and Broadcast Architecture, is heard on 35 smooth jazz stations around the country. Lewis, a living jazz legend, attracts audiences from both traditional jazz fans and from the smooth jazz buffs who regularly listen to the stations.

"Most listeners don't see a conflict between traditional and smooth jazz," contended Allen Kepler, Broadcast Architecture vice president. He said the Lewis show is the same type of "destination program" that many other commercial formats use to draw off-prime weekend or late-night audiences.

Scoffed at by many traditional and mainstream jazz buffs as "high-concept Muzak," smooth jazz pulled its best ratings ever last summer after 10 years as a distinct format, according to Frank Cody, Broadcast Architecture president and CEO. Cody said his firm helped pioneer the format, now heard on about 90 stations.

Cody said that KTWV(FM) in Los Angeles was number two in the key 25 to 54 demographic while WNUA(FM) in Chicago pulled a number one ranking in the 35 to 54 demo, meaning the format draws heavily among baby boomers.

Bob Parlocha hosts one of the few overnight satellite jazz services available, WFMT Jazz Satellite Network.

Other major-market smooth jazz stations that are doing well in the ratings, Cody claimed, are WQCD(FM) in New York, KKSF(FM) in San Francisco and KOAI(FM) in Fort Worth, Texas. Advertising revenues for smooth jazz increased about 75 percent between 1993 and 1996, according to Cody.

"Our current format is working exceptionally well," commented Steve Kosbau, program director at "Smooth Jazz 105.9," WJZW(FM) in Woodbridge, Va. He said his station had regularly pulled a 4.5 to 5.0 share among 25 to 54 year old adults in the last three years. WJZW also provides some traditional and mainstream jazz with a locally-produced program on Sunday evenings.

Adult appeal

Allen Kepler explained the appeal of smooth jazz as "the only format that features a lot of new music for adults. Adults get baby-sitters and go out to the (smooth jazz) concerts. It's a very active format." And, he said, many well-known jazz musicians who began as mainstream or traditional, such as George Benson. Grover Washington and Herbie Hancock, have smooth jazz hits on the charts.

Other musicians associated with mainstream jazz who are heard on smooth jazz stations include Kenny G, Patti Austin and Luther Vandross. Fleshing out the appeal of smooth jazz stations to baby boomers are pop artists, such as Earth, Wind & Fire, Sting, Mariah Carey and Marvin Gaye, who are part of the play list at many of these stations.

So, while traditional and mainstream jazz are losing ground as midday formats, they seem to have a secure place as niche and overnight programming, both on many noncommercial stations and on highly successful commercial stations where the primary format is smooth jazz.

■■■

S.D. Yana Davis is a freelance marketing consultant and writer in Knoxville, Tenn. E-mail him at yanajune@usit.net

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Local Focus Can Lead To Profits

Marlin R. Taylor

There are many stations that are failing when they could be profitable, and others that could be more successful if they better understood what is involved in "serving their community."

Let's not define "community" strictly in the geographic sense, although it does apply in many cases. Instead, think "family," or what a politician would describe as his or her constituency.

Take a few moments to contemplate these two questions: Do you have a loyal following that makes your advertisers' cash registers ring? Does every element of your programming contribute to building the loyalty of your "community" and cementing that relationship?

If you cannot give an unequivocal "yes" to these questions, it's time to put every second of your on-air product under a magnifying glass.

If you answered both questions in the affirmative, I have two more for you: Do listeners to your station feel good about and enjoy hearing everything that your station airs? Does every element serve a purpose, providing meaningful information or entertainment?

Saved by serving

If your station is located in a small market or in the shadow of large-market signals, your station mantra must be "local, local, local." When a person hears about events, happenings and people to which he or she can relate personally, it creates a bonding that cannot be captured any other way. Listeners receive an emotional reward for tuning in your station.

The value of building this relationship was brought home to me many years ago when an NAB convention attendee told me about generating high revenue in his tiny community by following three principles:

1. Treat every local event or happening as news and report it as such. This even includes announcements about plans for a fireman's parade or fireworks at the fairgrounds.

2. Put the "voices of the people" on the air, so listeners will hear their friends and neighbors. Don't just read the press release about the Women's Club's Annual Fair. Have the chairperson come in. Record a short interview and use excerpts in newscasts or special features.

3. Take the position that every local business can and should support the service you provide to the market, no matter how small their

See FOCUS, page 53 ▶

World Radio History

▶ FOCUS, continued from page 52

budget. Even if it is only 10 mentions a week in your "Where To Find It" directory, businesses benefit from having their name heard on your "dynamic, community-oriented radio station."

Notice that only one of the three points relates to sales. The other two make it possible for a station to generate more revenue.

One of my community service rules, regardless of market size or format, is to never air a national public service announcement. You can do a lot more to enhance your station image by producing localized versions for these organizations and causes.

Local telephone numbers, local addresses and local events should be your focus. Involve local representatives for large national organizations like the Red Cross and Cancer Society.

And for goodness sake, avoid PSAs that are not relevant to your audience. The other day I heard an adult standards station airing a promo for the college tuition plan of the National Guard. Airing information that is irrelevant to your audience communicates a subliminal message that you don't truly care about them; you are just putting something on to fill an obligation.

Try it, you'll like it

See the accompanying box for a few examples, gathered from here and there, of features you can produce to better identify your station with its community, and even provide interesting and useful information to listeners. Some are naturals for sponsorship.

How do you gather and prepare this material? In your community are knowledgeable persons with journalism training and writing experience who would enjoy doing this on a part-time basis. I would seek out one of these people and employ him or her as your "Community Affairs Director."

How do you cover cost? Make this area a profit center! Sell sponsorship to one feature and you've paid this person's salary.

What is your source for this information? Anywhere and everywhere. I'm sure you receive tons of press releases. Mine them thoroughly, not just for information, but for ideas too. Once people find out you are actually using the stuff, you'll receive even more.

Read local newspapers and regional and business magazines. Check the websites of large organizations with a presence in your area.

Expect every staff member to play a role in the gathering process, just as everyone should be prospecting for potential advertisers and providing leads to the sales department.

Focus on serving up more effective community-oriented programming, and you'll see your share of advertising dollars begin to grow.

Serving your community is not an expense; it's a profitable investment in your future. While scanning the dial the other day I heard a radio preacher say, "We'll win by serving!" And I said, "Amen."

■■■

Marlin R. Taylor was the founder and creative director of the former program syndicator, Bonneville Broadcasting System, and is now a consultant. You can reach him at (215) 348-0707 or by fax at (215) 348-7708. Got ideas of your own? Tell us about them.

Marlin R. Taylor suggests these feature ideas as ways to better serve your community.

☞ ***"Citizen/Person of the Day."*** This can be a person of achievement, a person doing something significant or even a businessman you are trying to sell. I first heard this on WPCH(FM) "The Peach" in Atlanta several years ago. Their message said, "Our Peach Person of the Day is Marlin Taylor. When you see Marlin Taylor, wish him a Peach of a Day."

Another approach is to give some background info on the person being saluted and the reason you are honoring him or her.

☞ ***"Scholar of the Week."*** Salute a college or high-school student who has excelled academically. You'll find that once you begin this, many candidates will flow in.

☞ ***Create a daily pre-recorded report and name it something like "Moberly in Focus."*** Fill it with newsworthy items and happenings in the community that are not particularly time-sensitive. The program can be aired several times a day, and sold!

☞ ***"Community Spotlight."*** A one- or two-minute feature focusing on a local non-profit organization, preferably one that has a special event coming up.

☞ ***Short vignettes about historical events and places of interest in your coverage area.*** These are timeless and can be rotated forever if each is aired sparingly. Your local historical society will likely do much of the preparation in exchange for a mention.

☞ ***"Pothole Patrol."*** Spotlight a bad road, or even a single big hole on a busy road.

Have station staffers make notes in their travels, or let listeners nominate holes. This can be a fun thing, where you simply salute the pothole; or challenge the appropriate highway official about when repairs will be made, then report the response on the air.

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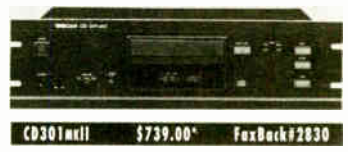
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World Radio History

PROMO POWER

Don't Shoot the Messenger

Mark Lapidus

The argument goes like this: "Advertising a radio station on television does not work. If you have decent programming, people will find you."

It's fashionable for radio people to deny the power of outside advertising. From group heads to general managers, the mantra in circulation denies the effectiveness of television, direct mail, billboards, bus backs, telemarketing and any other mass marketing product that costs money.

Managers might have to admit they cannot afford marketing due to budgetary woes. Many who bought after deregulation are having to meet difficult cash flow requirements. After staff consolidation, marketing is the next line item to go.

Insult to industry

However, when managers make a blanket statement that advertising does not work, they are insulting their own industry. If advertising does not motivate consumers, most of us would be out of work! Let's look at the variables that affect the quality of outside advertising at a radio station.

The outside marketing of a radio station is like playing multi-dimensional chess. It's not just what you're doing; it's what everyone else in the market is doing at the same time. When five radio stations telemarket to 25- to 49-year-olds at the same time, there is an enormous problem.

In all likelihood, the stations will reach the same active households who will first be confused, then irritated, by the quantity of phone calls from radio stations. There isn't much you can do about what your competitor has planned except to use common sense about their history.

Most stations with the same general manager do the same thing every year. In Washington, you can predict who will be on television and who will do direct mail every fall. However, one advantage of group ownership is that this competition for 'share of voice' could be controlled. I say 'could be,' because in most cities, marketing for a group is still not coordinated. (A related problem surfaces when many co-owned stations hold their major events on the same days!)

A confused, complicated or bland marketing message is another reason for outside marketing failure. It is shocking how many stations will spend $15,000 to $100,000 making a television spot, and then fail to test it with a few focus groups to see if they comprehend and like the message.

Schedules in top-10 markets run from $200,000 to $1 million. Similarly, messages for direct mail and transit can be easily and inexpensively tested. I am convinced most stations don't do any testing because they really do not want to hear a potentially negative response.

Down to the wire

Many marketing campaigns in our business are built at the last minute, with copy and spots being overnighted for immediate use. When planning is this poor, there's no time for testing and then fixing and re-testing. Sure, this is a time-consuming process, but consider the investment. (By the way, for regular television users, I highly recommend a timeless book by Steve Marx and Pierre Bouvard, "Radio Advertising's Missing Ingredient: The Optimum Effective Scheduling System," available through the NAB.).

A bad or boring radio station is another reason why outside marketing fails. Don't ever market a radio station when the product isn't fabulous. Bringing outside cume to a poorly executed format can kill you. It's like inviting someone to your house for a boring party with bad food. They're not likely to return for more torture.

Can some stations afford not to market? Absolutely. There are heritage properties that have tremendous unaided recall and enormous cume/time spent listening. They own a position in a listener's mind. In this instance, managers have to watch any trend of decline and be prepared to market in the event of a direct attack.

When you're the big dog, it's easy to slip into complacency. A downfall can happen so gradually you don't notice it at first. Suddenly, you're not doing double digits anymore and the first instinct is to 'fix' the product. Careful! Your problem may be marketing-related more than anything else.

"I use my own station to market my product," is another common argument used in cutting the outside marketing budget. It's a given that a station should be using its own air time to market the product. This is a necessary complement to outside marketing, but not a substitute. The next time someone lays this one on you, ask them how many times a message has to air on their own station to reach one person three times. Few will be able to answer the question. It's much more likely that a salesperson will know the answer than the marketing director or program director.

When outside marketing fails, look carefully at the many reasons for failure. Blame the effectiveness of the message; the amount of money spent; or even how flights were scheduled. But don't shoot the messenger.

■■■

Mark Lapidus is president of Lapidus Media, which is launching UPCOUNTRY, an uptempo '90s hits format to compete with mainstream country.

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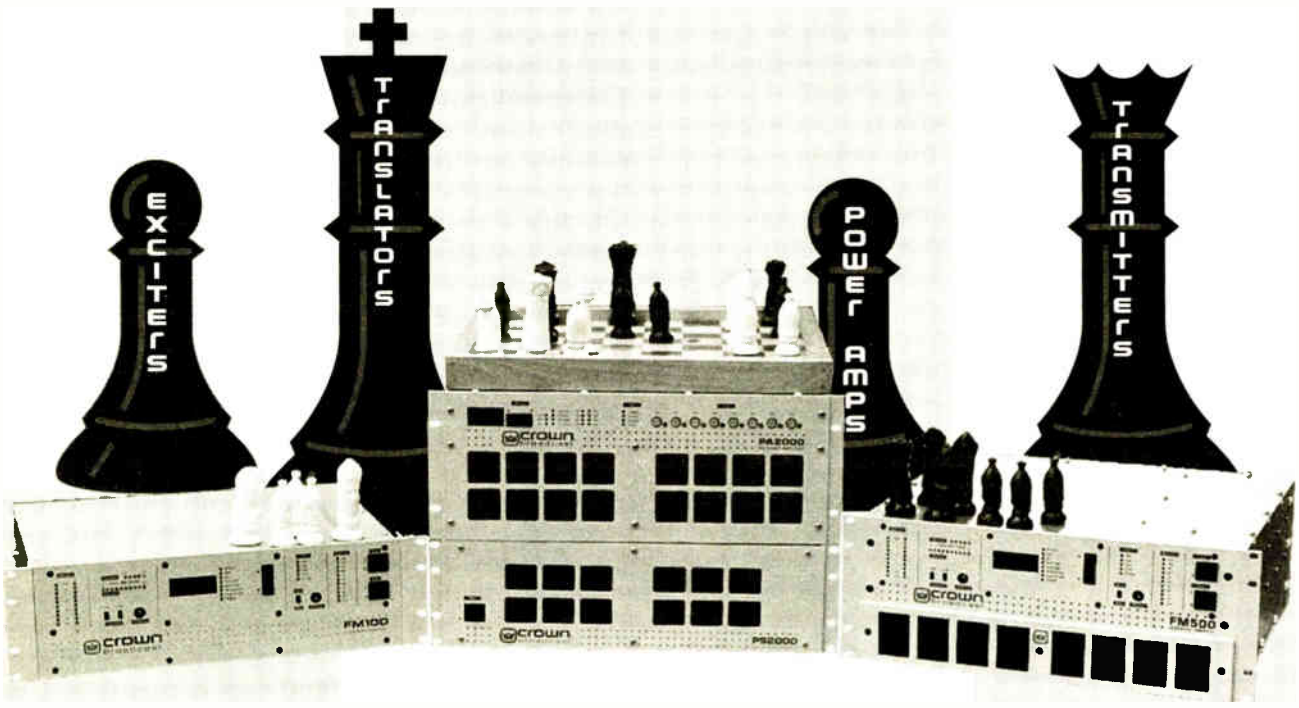

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Circle (89) On Reader Service Card

World Radio History

The 'Five Femmes' of WNEW

Vince Santarelli

It was the summer of 1966. The FCC had just issued a ruling forbidding co-owned AM and FM stations from simulcasting 24-hours a day. The ruling opened up a new medium to broadcasters, who previously had put all of their eggs in the AM basket. Some broadcasters simply automated their FMs and programmed whatever was available at the cheapest cost. Others were more creative and came up with original, pioneering radio.

The underground scene started in San Francisco and Los Angeles and quickly spread East. A medium that until then, was geared almost exclusively to classical and beautiful music, suddenly, was blaring forth rock 'n' roll. And in New York, something else was changing: the voices.

Alison Steele (left), Margaret Draper (bottom), Arlene Kieta (second from right) and Ann Clements (right)

Gender bender

Metromedia Broadcasting owned WNEW-AM-FM in New York City. The hugely successful AM played music of the 1930s through the early '50s. It was one of the first stations in the country to program recorded music and to have regularly scheduled disc jockeys.

When the FCC ruling came down, Metromedia executives were faced with the "what shall we do with our FM" dilemma. They decided to take the creative route, playing "the newest, alivest of today's music" on the FM: "The 'Now' Sound."

In fact, the music was nothing special. What set the station apart was what you heard between the songs: All of the DJs were female.

Nell Bassett, who now works for the North Jersey Arts Center in Bergen County, N.J., was one of those disc jockeys.

"The powers-that-be at Metromedia decided to go with female disc jockeys because it had never been done before," she said. "So they made a six-to-eight month search of women all over the country and came up with Pam McKissick, an actress; Ann Clements, a beautiful well-known model; Alison Steele, who had been active in radio prior to this; Arlene Kieta; and Margaret Draper. And then they decided that they wanted a black woman. They looked high and low and they finally heard a tape of me and some work that I had done at the Bermuda Broadcasting Company. The program director, John Dale, called me, and the rest is history!"

Bassett was due for a promotion at Bermuda but decided to "go for it" at WNEW, as its "Fifth Femme."

"We were all introduced at this gala luncheon at Tavern on the Green in Manhattan," Bassett said, "and all of the AM male disc jockeys were there — William B. Williams, Ted Brown, Gene Klavan — and they all supported us 100 percent. It was very exciting. Here I was, an island girl from Bermuda suddenly in the spotlight in New York City. I almost felt out of my element. But we found that once we got this thing started, we got tremendous amounts of help and guidance from Willie B. and Ted Brown. They actually took us under their wings and helped us do our thing on the air."

Quick start

There were personal appearances nearly every night, and the women found themselves in the spotlight.

"The response from the public was phenomenal," Bassett said. "We were involved in public appearances with the likes of Harry James and Nancy Wilson. And, of course, through it all, we all knew that we were pioneers. We actually felt like we were opening up doors to women that had previously been shut tight."

They were not the first women to make their mark as radio air talent, by any means. But the all-female lineup was a novelty. The format and the fun continued for a little more than a year, but the ratings were not adequate. For the April-May period in 1967, WNEW-FM pulled a 1.1 overall, comprising a 1.6 overall rating among men, and a .9 overall rating among women. By the October-November book, the overall number of men dropped to a .9; female listernership held at a .9.

The same ratings book showed "Progressive Rock", WOR-FM, with a staggering 21.2 rating among 18- to 24-year-old males! But WOR-FM saw greater potential in the top-40 format, and made a switch in the fall of 1967. WNEW-FM pursued the male demo, gradually dropping the female DJs and adopting the new "Progressive Rock" format.

"One by one the ladies were replaced by the likes of Scott Muni and Rosko," Bassett said. "Alison Steele and I stayed until the very end. In fact, Alison came back with the new format. When I left, I went to work in the television soap opera field and then worked for a couple of other New York radio stations. But we all knew that we had accomplished something very special and very important at WNEW."

Nell Bassett, 1966

The change to the new progressive rock format was successful. Thirty years later, the station continues to air cutting-edge rock 'n' roll.

The decision to use an all-female disc jockey lineup, while not as successful for the station, afforded women the opportunity to make inroads into a largely male domain.

■■■

Vince Santarelli is the editor of the monthly New York radio newsletter Apple Bites. He can be reached by e-mail at Applebites@usa.net

World Radio History

Give 'Em a Reason to Buy

Dick Taylor

Persistence and contact with clients can be the key to sales success, as this recollection illustrates.

Back in 1981, I was the newly appointed sales manager of a small radio station WUPE(FM) in Pittsfield, Mass. We hired a sales representative by the name of Lee Scaccia. I accompanied Lee on some of his sales calls as we worked with local businesses on their radio marketing and advertising.

Lee was tenacious at his craft, but there was a memorable instance when Lee needed my help to retain a dissatisfied client, an instance that shows how sales managers can assist their new hires, to the benefit of all parties involved, including the station.

Enthusiasm to burn

Lee called on a brand new business that had just opened up on the outskirts of town. This company sold firewood.

In New England, wood stoves are very popular for providing ample warmth at low cost during the winter. The only problem is that people have to go out into the woods, cut down trees, cut the trees up, haul the wood home and stack it neatly before it can be burned in their stoves. Needless to say, this is a lot of work!

This business had acquired a machine that took the trees and cut them up into logs that fit easily into a fireplace or wood stove. They cut the wood and delivered it in nicely stacked piles, one cord at a time.

Lee met with the copy writer and production director and they set out to create the award-winning radio production of the year.

The radio commercial Lee created was nothing short of brilliant. Lee then designed the perfect radio schedule to air the ads on our radio station, and we went out to visit the client.

Well, the client loved the spot! Lee brought back the biggest order he had ever written, and the radio spots began airing the very next day.

Thirty days later, Lee showed up in my office wearing a big frown. He was depressed.

"The campaign hasn't produced a single customer. The client is mad and wants to cancel immediately," Lee told me.

"Well, let's go out and see him," I replied. "I've been dying to see this wood-splitting machine up close."

Cutting into business

Lee and I climbed into the car and drove out to see the client. He was busy cutting big trees into wood stove-size logs and stacking them in huge piles when we arrived on that hot summer day in July. The kind of day the sweat just rolls down your neck from simply breathing — Hot and Humid, with a capital "H"!

The client told me he loved the commercial. He heard it played often on our station, but not a single customer contacted him to buy some wood. So I asked him if people normally buy wood in July.

"No, are you kidding?" he asked. "They wait until the snow is in the air and they need to fire up their stove."

"So it's not normal for people to buy wood at this time of the year then?" I asked.

"No!" he replied.

"Then why would anyone ever come all the way out here to buy wood at this time of the year? What would be their incentive?" I inquired.

"Oh, that's easy," said the man. "Price! The wood I sell at this time of the year is one-third of what I sell it for in the winter," he said.

"But we never told the people that fact in our radio commercial," I said. "That's the most important reason for people to buy and buy now," I said.

"You're right," he replied. "I think now that we know everyone is aware that you have this fine machine, we need to tell them to buy now and save one-third off winter prices. I want you to continue advertising for another 30 days with that message," I said.

"Lee will be back tomorrow with the new radio ad for you to hear. And I will personally write the copy," I said. "We are going to give listeners a reason to buy in July."

New ad

The man agreed to give it a try and we left for the station to prepare the new ad. Without changing the schedule a bit, we aired the new ad — with one voice, no music or sound effects — for the next 30 days.

By the time we drove out to see the client, his piles of wood were gone and a big smile was on his face. "Wood's selling as fast as I can cut it," he said.

"I knew it would," I said. "We spoke the consumer's language and delivered the perfect reason to buy now. But not everyone will buy in the summer, and that's good news. When the snow flies we'll stop talking price, and we'll bring back that award-winning spot that talks about not having to go out into the cold, cold woods and chop-and-cut, drag-and-haul and stack," I said.

"When the snow begins to fall, that's all the incentive we'll need to get the rest of the people to buy, and buy at full price, too."

The smile now grew even wider on the man. Lee was pretty happy too.

■■■

Dick Taylor is the former general manager of WFPG-AM-FM in Atlantic City, N.J. Reach him at (609) 652-6625.

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Digital Audio Codecs

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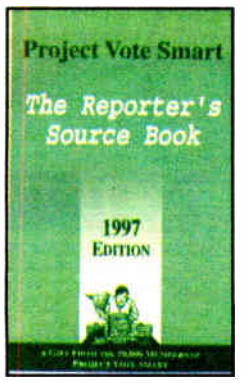

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"Congressional Snapshots for Radio" is a 60-second tape that covers the positions and voting record of your U.S. Senators; "The Reporter's Source Book" lists interview sources and printed summaries of current issues; the "Vote Smart Yellow Pages" categorizes information from political websites; and "The Reporter's Resource Center" is available to provide research and materials to reporters.

For information contact John Gordon at Project Vote Smart, (541) 754-2746; or ***circle Reader Service 3.***

'The Christmas Box'

Listeners will have a special treat this holiday season, as "The Christmas Box Radio Special" airs on several radio stations. The holiday tale, based on the popular book by Richard Paul Evans, also has aired as a Hallmark TV movie.

Last year "The Christmas Box Radio Special" was carried on 400 radio stations between Thanksgiving Day and Christmas Day. It will be carried on over 600 stations this year, with many stations airing the program twice.

The two-hour program primarily will run on talk, AC, country, and oldies stations, targeting the 25-plus age bracket, but is not limited to any specific group of listeners.

"The Christmas Box" is available on a barter basis and is delivered on CD. Stations are asked to broadcast the program only once between Thanksgiving and Dec. 7. After that, stations may air the special any time until Dec. 26.

James Earl Jones and Richard Thomas lend their vocal talent to the broadcast. A big success when it aired on Thanksgiving Day last year, "The Christmas Box" is a wonderful way for radio stations to provide a festive addition to their loyal listener's holiday celebrations.

— Stephanie Muller

For more information contact Brandi Anderson at Richard Paul Evans Publishing, Inc., (801) 532-6267; or ***circle Reader Service 2.***

An 'Independent-Minded Broad'

For Judy Jarvis, every day is Independence Day.

Jarvis brings a solid writing background (Time, Boston Globe) to her call-in show. Jarvis refers to herself as an "independent-minded broad."

"The Judy Jarvis Show" is fed on SatCom C-5, and is aired from noon to 3 p.m., against Rush Limbaugh.

The nationally syndicated program airs on more than 40 stations nationwide, including 10 of the top 20 markets. Jarvis Productions syndicates the show through Media Syndication Services, Inc.

"The Judy Jarvis Show" website is located at *http://www.judyjarvis show.com*

For information contact Deborah Shillo, Jarvis Productions, (860) 242-7276; or ***circle Reader Service 4.***

Comedian Scoots to 'Boot'

Country music and comedy can make for a good match. Premiere Radio Networks is banking on it.

Comedian Ed Steinfeld is now part of "Boot Scoot'n Party'N Nights." Steinfeld has performed on or written material for "The Dennis Miller Show" and "The Tonight Show with Jay Leno."

Steinfeld joins "Hollywood Harrison," who hosts the show, which is approaching its third anniversary. The anniversary will be marked by a special broadcast from Walt Disney World.

For information contact Premiere Radio Networks, (818) 377-5300; or ***circle Reader Service 5.***

Let the Games Begin

There's nothing esoteric about the opportunities your station has to send clients and listeners to the top sports events of 1998. It's all spelled out in the latest brochure from Esoteric Sports Tours.

"Esoteric Sports Tours is working hand-in-hand with radio companies to fulfill their special requirements," said Carey Dean, vice president of marketing for the company. "We are providing travel for both individual and group contest or incentive winners. ... One call, and all the details of the promotion or incentive fulfillment are taken care of immediately."

Esoteric Sports Tours offers packages to the Super Bowl, the Kentucky Derby and the Final Four among others.

For information contact Carey Dean at Esoteric Sports Tours, (800) 321-8008; or ***circle Reader Service 6.***

A Slice of the Sports Audience

Golf on the radio? Believe it.

Billing itself as "golf like you've never seen it," the PGA TOUR Radio Network and broadcast partner PGATRN offer live network coverage of tournaments; leaderboard updates for drive time on Thursdays and Fridays; and a weekly golf magazine show, "Straight From the Tour."

"We're as comprehensive as television," said Warren Elliot, PGATRN co-managing director and executive producer. "We use digital, computer, wireless, remote and cutting-edge equipment to bring professional golf coverage to our listeners."

The Clearance Group and Network Partners, Inc., are tasked with building the affiliate base for the PGA TOUR Radio Network.

For information contact David Wynn at PGA TOUR Radio Networks, (888) PGA-RADIO (ext. 11); or ***circle Reader Service 7.***

ZERO.
ZILCH.

The Engineer's Dream Machine.

World Radio History

Resource for Source Gear See Page 60

The DA-302 Is on the Horizon

Don Elliot and Ann Schwab

"What if you could have a device that would copy DAT tapes at double speed, without even tying up the console or messing with levels? What if it gave you the ability to record two DATs simultaneously — netting two tapes of the same generation — or simultaneously record one analog DAT and a second DAT from a digital source ... and in just one rack-mounted box? How much would you pay?

"But wait, there's more! You won't have to do any patching, unpatching or repatching, or worry about channel reversals. You'll be able to make great, DAT-quality airchecks with an eight-hour walkaway time. Now *how much would you pay?"*

OK, the TASCAM DA-302 won't do as much as a box of Ginsu knives. But unlike many of the products advertised in that manner, this dual deck DAT recorder/player appears to have the quality and features to match the acclaim.

TASCAM reports that it is receiving positive feedback about the unit, which received "Cool Stuff" honors from **RW** this spring and is scheduled to begin shipping this month. The professionals in the radio and production businesses we interviewed were excited about working with the unit, based on its description and promised specs.

Boston-based station owner and broadcast consultant Dave MacNamee said, "As an owner who keeps an eye on the bottom line, this looks like something that may save me an hour or so a day. It would pay for itself almost immediately."

Roger Maycock, marketing support manager for TASCAM, said saving money is part of the idea. "It makes an exact duplicate of a DAT, with identical ABS times between tapes. Now, for the first time at an affordable price, you can back up DAT tapes with identical ABS and timecode.

"I think that the real key here is that this is the first time, a dual DAT

machine has been made available to the public at what we consider to be a reasonable price point and with the ability to do simultaneous cascade record capability, which required quite a bit of additional hardware in the past."

Time is money

In an industry where time can literally be money, saving time is critical. For example, rolling two DATs simultaneously during a session nets a "B-roll" tape that can be used for backup or to give to a client, who can immediately walk away without waiting for a backup dub.

Dealers seem impressed. Gary Beebe of Broadcast Supply Worldwide said, "The savings in duplication time will have a great advantage for production studios in making copies."

Charlie Tuna, air talent/voice over talent for Art Ferguson Productions in Los Angeles, said, "I do a lot of freelance work, and when I'm turning out projects where I'm not paid by the hour, it would be incredible not to have to tie up my console in the studio to make a dub of a DAT; this (unit) makes for extremely efficient and more productive use of my time."

Why not simply hook up two independent machines to accomplish the same objective? For one thing, Maycock said, the ABS would not match, and the two machines simply could not accomplish everything that the "TASCAM Tandem" can.

"You can cascade multiple units for recording," he said, "but the high-speed dubbing will only work within the same unit.

"The DA-302 has a synchronization cable to lock machines together and the units have a pre-roll overlap at the end of one tape into the beginning of the next so that no material is lost during the transition from one tape to the next. The cascade (ability) from one machine to another makes the DA-302 an excellent choice for long-format recording, and if you drop the machine into the 32 kHz mode, with a standard 120-minute DAT tape, you get eight hours of continuous record time, which is more than adequate for even the longest corporate board meeting or college lecture."

The unit will copy time code if it is present (embedded in the subcode area on the master).

Based on those specs and features, Ben Manilla of Ben Manilla Productions in San Francisco called it "the perfect package for a busy production studio."

Technicalities

The TASCAM DA-302 dual DAT has 44.1 kHz and 48 kHz sampling, providing a choice for the most suitable rate.

The optional WR-7000 synchro cable allows multiple DA-302s to be interconnected, with single-keystroke duplication from the master machine. With the "append" dubbing feature, dubbing can be started from any position on the master, eliminating the need to rewind and start from the tape's beginning each time.

There are independent S/PDIF digital inputs and outputs for each deck, enabling each to record digitally or transfer different material simultaneously. Deck 1 can be recording digitally while the second deck is transferring material digitally to an external unit — a time-saver for anyone facing deadlines.

For analog connections, the DA-302 can be integrated into the studio using

the recorder's unbalanced RCA inputs and outputs, or use the optional LA-D302 balanced kit, which provides

See TASCAM, page 60 ▶

Your Studio Source Resource

Studio audio sources can be almost anything: vinyl records and turntables, reel-to-reel tape, binary numbers converted by hard drives or laser pits read by a laser beam. Every year, new technologies and products that play audio find their way into the radio studio.

This month, *Buyer's Guide* examines studio audio sources. We've included the newest or most popular CD players, MiniDisc players, cassette decks, two-track voice systems and DAT units ... and yes, turntables, reel-to-reels and cart machines, too.

In April, TASCAM received a "Cool Stuff" Award from **RW** for its new dual DAT recorder. Don Elliot and Ann Schwab spoke with TASCAM about the machine and to several people in the broadcast industry about their reactions to the product, scheduled to ship this month.

Read Burgan spoke with leading radio industry dealers and distributors to ask about trends in studio audio sources. He uncovers some surprising facts and bold predictions from the people in the unique position between the manufacturer and the user. He also takes a special look at past audio sources. Is there a market for turntables and reel-to-reel?

You'll also find an extensive list of audio source products starting on page 58.

Please e-mail your responses and suggestions for *Buyer's Guide* to *sgary@imaspub.com*

— Susan Gary
Buyer's Guide Editor

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World Radio History

What's Replacing the Carts?

Radio Dealers and Distributors Discuss Trends, Predict Future Benchmark Studio Sources

Read G. Burgan

The introduction of tape cartridge machines in the late 1950s signaled a revolution in broadcasting. Within a decade, the tape cartridge had become *the* medium in broadcasting, and eventually became the predominant medium for storage — from news actualities to commercials to individual music cuts. It would be hard to imagine broadcasting as we know it evolving without tape cart machines.

If the dealers we surveyed are unanimous on any one thing, it is that tape cart machines have little future. Although at least three companies still produce cart machines, most manufacturers have turned their attention to other solutions. Yet it is a tribute to the cart that new technology still is marketed in cart machine terms.

According to the dealers that spoke to **RW**, the leading contender in the fight for cart machine replacement is the 360 Systems Instant Replay, a hardware-based system using an internal hard drive providing as much as 24 hours of record and storage time.

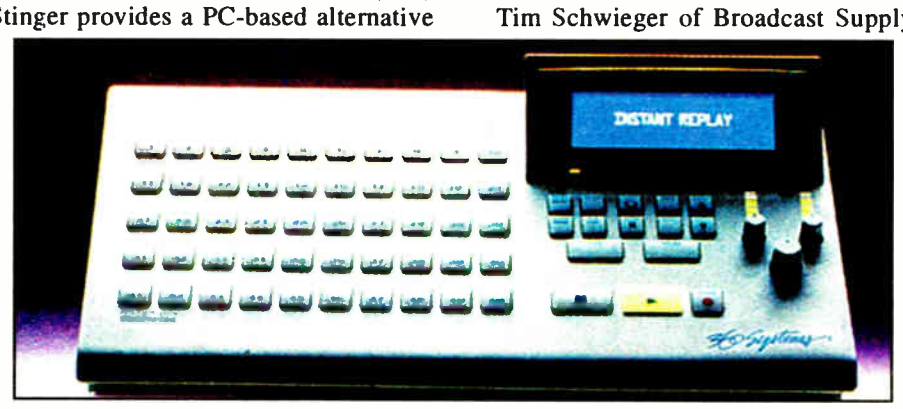
Why?

"Instant Replay is CD quality, is never out of alignment, is never out of phase and doesn't shed any oxide," Dave Burns of dealer Harris Corp. said.

The unit has 50 keys on the front panel that can be assigned a maximum of 1,000 cuts in stereo with a frequency response of 20 to 20,000 Hz and a dynamic range of 90 dB. It has both analog and digital inputs; the digital inputs are capable of converting any incoming sample rate from 24 to 56 kHz, while the output has a sampling rate of 48 kHz. Analog inputs and outputs use balanced XLR connectors.

It contains either a 1, 2 or 3 GB hard drive. A threshold control allows for automatic recording when the source reaches a certain level. Fifty hot keys provide instant access to spots.

There are alternatives to the cart machines and Instant Replay; many are software solutions. For example, the Broadcast Software International (BSI) Stinger provides a PC-based alternative to carts. Stinger is described as an "instant access audio player."



The Instant Replay from 360 Systems is a leading contender in the race to replace cart machines.

"A neat thing about Stinger is that we actually preload the first 500 milliseconds to 1,500 milliseconds of the file, depending on the sampling rate, so that startup is instantaneous," said Ron Burley of BSI. "When you hit that button, it doesn't have to go open up the file, grab it and start playing. When you load that set, all 36 files are primed and ready to go."

Minnetonka Software Inc. also provides software that can be used as a cart machine called Fast EdDit, basically a combination of the discontinued Fast Eddie and EdDitor Plus software.

According to one Minnetonka programmer, one of the chief strengths of Fast EdDit is the ease of use, requiring almost no learning curve. "That's its strength in the radio world. Larger companies like WGBH in Boston, RTE in Dublin, BBC and SBC (the Swedish Broadcasting System) all use it because it's real straight ahead and they can sit down and teach someone how to use it in 10 minutes."

What about other studio audio sources? Most dealers report that MiniDisc either is increasing or holding its own among broadcasters. Bob Sheffield of Full Compass said, "MiniDiscs seem to be a big deal. We can't get enough of them as far as consumer-based units go, and they seem to be going primarily into broadcasting. We're sending a ton of them into that market."

Tim Schwieger of Broadcast Supply Worldwide said, "We are finding that many people are using MiniDisc in the newsroom, replacing not only audio cassette but cart machines. Rather than putting their news actualities on cart, they are putting it on MiniDisc. More and more portable MiniDiscs are going out in the field, and they then take it back to the studio and edit it out."

Supply and demand

While all dealers report strong sales of DAT recorders, the demand seems to vary from dealer to dealer. Chris Shute of Broadcasters General Store said the rapid growth of DAT sales in the past few years seems to be flattening out.

"DATs seem to be tapering off. I've noticed a decline in the sale of DATs as MiniDiscs have proven themselves." Whether this means DAT is reaching the saturation point among broadcasters, or that broadcasters are using other products like MiniDisc in place of DAT, is not clear.

Most report that DAT is being used for long-form archiving like concerts

See TRENDS, page 63 ▶

Investigating the Future of Some Old Favorites

With the new technologies and products that radio managers can choose from, what has become of reel-to-reel, turntables and other familiar studio standbys? What if stations can't afford all the new stuff?

If turntables are not dead, they certainly are comatose — although John Lackness of dealer Crouse-Kimzey reports he can not keep them on his shelves. "We thought vinyl was going away and it's making a comeback again. We can't keep turntables in stock," he said.

Most dealers report selling a turntable every few months, mostly to institutions or to mobile DJs. Dave Burns of Harris Corp. said, "We used to sell 200 turntables a month; now we sell one every two or three months to a library or an archivist or a university where they're converting black vinyl to another format."

The Technics SL-1200MK2 is one of the few turntables still made; it is popular both with DJs and archivists, and can still be found in radio studios. Gemini and BST also make turntables.

Reel-to-reel retains a market, primarily among stations with existing tape libraries. Dealers report that stations also receive a sizable number of commercial spots on reel from local ad agencies.

"Many advertising agencies that provide commercials to radio stations, particularly in local or small markets, are still doing final duplication and mastering on reel-to-reel," said Tim Schwieger of Broadcast Supply Worldwide. "So, many radio stations are forced to keep one or two machines in good operating service."

Manufacturers still making reel-to-reel equipment include Tascam, Studer and Otari. But choices are diminishing while prices seem to increase each year. One popular two-track model now costs more than $4,000.

Radio equipment users are in a familiar spot: They prefer a certain list of specialized features on their audio gear, but they don't want to pay a lot. Manufacturers that care about the broadcast industry respond with industrial products designed for radio use. They must charge more, because they know they will never sell in the quantities to which consumer manufacturers are accustomed. But these products offer radio-specific features, and the manufacturers tend to understand the radio market, supporting it with service and parts.

Changing gears

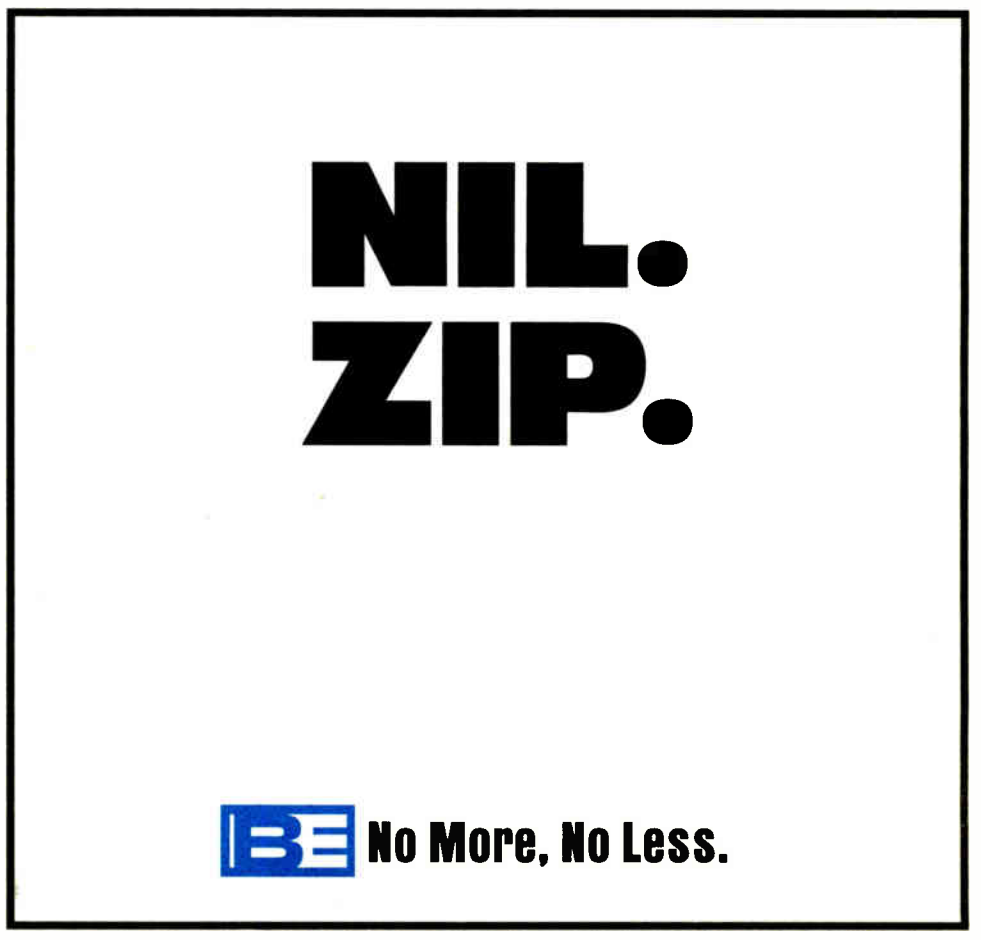
The buyer can turn instead to consumer products, which were never intended for heavy radio use. These buyers save money but must recognize that the product's life span will be short and service difficult. Many radio stations have taken this route with CD players, MiniDisc and audio cassette machines.

In fact, many dealers find it hard to keep up with demand for consumer CD players. Frequent model changes or discontinuations by big manufacturers complicate matters further, as typified by the recent decision by Technics to discontinue its popular SLPG-350 and -450 models.

"Some of the small-town stations would buy these Technics units, hold on to them for a year and toss them out the door," Lackness said. "They can't do it any more, so that's putting them into a budget crunch."

Sony and other manufacturers do offer some choices for radio buyers who want a low-end consumer CD player. But increasingly, consumer manufacturers are turning to multi-CD machines, limiting the options for radio buyers who want a machine that only costs a few hundred dollars.

— Read Burgan



World Radio History

TARGET: AUDIO SOURCES

Source Gear for Your Studio

Manufacturers have developed many new ways to get crisp audio on the air. Although the traditional sources still occupy space in the radio studio, radio buyers can find powerful new equipment choices on the shelves and in the catalog pages of equipment suppliers.

The cart machine remains a favorite comparison, even in these post-cart days. Many developers have kept the familiar aspects of cart decks and transferred them to their new products.

360 SYSTEMS

The Short/cut, Version 2.0 was recently released by **360 Systems.** The new version incorporates new features and updates to the Short/cut Personal Audio Editor.

A self-contained unit, the Short/cut is a two-track digital audio editor with built-in hard disk, speakers and a waveform display. According to the company, it offers "true cut/copy/paste editing, a realistic scrub wheel and conventional tape transport controls."

The Short/cut also adds support for an external Zip drive; Zip disks can be used for recording, editing and archiving, and provides an method of facilitating file transfers. Short/cut can also create a DigiCart/II Plus formatted Zip disk and store audio files to the disk for playback on DigiCart/II Plus units.

Short/cut Version 2.0 comes equipped with the 360 Systems D-NET file transfer capability, which provides the electronic transfer of audio files and related information such as cut names and running times.

For more information, contact 360 Systems in California at (818) 991-0360; fax: (818) 991-1360 or ***circle Reader Service 121.***

TASCAM DA-302 May Prove Itself Soon

▶ TASCAM, continued from page 58

XLR connectors. Either way, one set of program material can be sent while the other deck feeds a different set of material to a different destination. The headphones can monitor deck 1, deck 2 or a mix of both.

The user-selectable Copy ID function provides three choices: one digital copy, no digital copies, or unlimited copies — thus giving the user complete control over the tapes.

The DA-302 uses 1-bit Delta Sigma A/D and D/A converters, which the company says provides a natural, transparent sound. The controls are laid out logically, with independent transport controls for each deck, and easy-to-understand keys and switches for common system parameters. The unit features a wide fluorescent display showing levels, time displays, start IDs and so forth.

Will the DA-302 live up to its promise? The potential benefits are clear, but only a year or two in the trenches of radio work will tell if the machine can impress the notoriously tough radio crowd. If it lives up to its specs and features, the time-saving (and therefore money-saving) aspects will attract owners, while the quality and flexibility will appeal to discriminating producers.

■■■

Ann Schwab is a freelance writer and broadcast consultant.

Don Elliot is a voice actor in Los Angeles and operates Don Elliot Creative Services, specializing in commercial, jingle and promo production. He is the house voice of KFI/KOST.

AKAI PROFESSIONAL

Akai Professional introduced the DPS12 12-track digital personal studio at the AES show in September. The DPS12 is a 16-bit, 12-track unit using an optional internal 1 gigabyte drive for recording media. Six balanced analog inputs use reference-grade mic preamps.

Using the analog inputs combined with the S/PDIF optical I/O, the DPS12 can record a maximum of eight tracks simultaneously, with 12 tracks on playback. The 12 tracks utilize no compression and offer full random-access edit capability with no generational loss.

The DPS12 features a 20-channel digital mixer with programmable EQ; 12 assignable faders and pan pots combined with the virtual mixer display allow real-time mix control of all 12 tracks and eight inputs simultaneously.

For more information, contact Akai Professional in New York at (817) 336-5114 or ***circle Reader Service 122.***

DENON

The **Denon** C680 is a professional CD player designed for broadcast studios and discos. The DN-C680 features index search; AUTO SPACE, which inserts a silent space of approximately four seconds between tracks; AUTO EDIT, which divides the total recorded time on the disc in half and rearranges the tracks to fit on A and B sides; and display of playback locations.

It contains an FL display, which shows the track number, minutes, seconds, frames and the track name; illuminated rubber buttons; a track search select knob; and a jog/shuttle wheel. In addition, the unit features program play for a maximum of 25 tracks, play and finish modes, auto cue, an EOM message, pitch control and pitch control.

Pressing the END MON button during standby will cause the unit to preview the end of the track for accurate "outros." The point at which monitoring starts can be set within a range of 5 to 35 seconds prior to the track's end. The unit occupies three rack spaces.

For more information, contact Denon in New Jersey at (201) 575-7810 or ***circle Reader Service 123.***

DRS AHEAD TECHNOLOGIES

DRS Technologies offers the Series

See SOURCES, page 61 ▶

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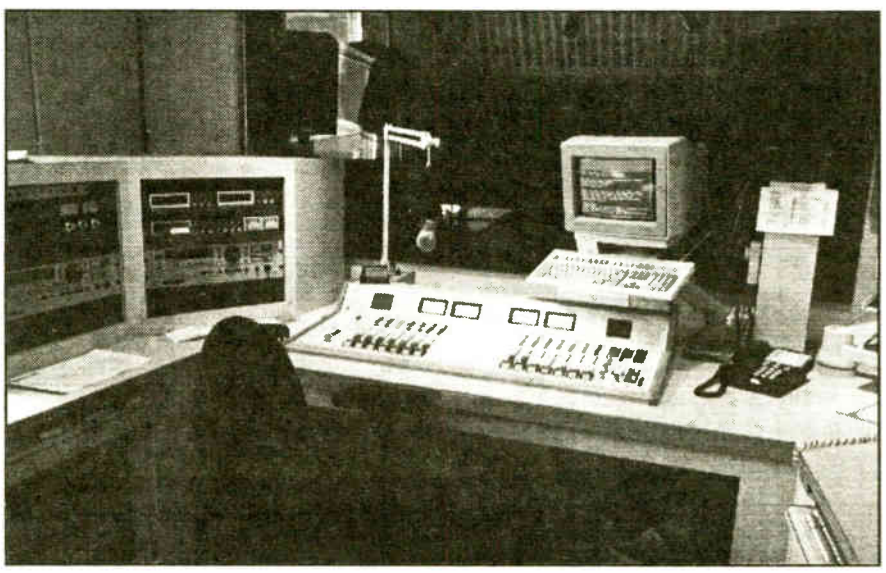

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World Radio History

▶ SOURCES, continued from page 60

99B audio tape cartridge machine. Formerly made by ITC, the 99B features ELSA for cartridge preparation; the ELSA system can erase the cartridge, locate and properly position the tape splice and adjust the azimuth of the record head.

Three cue tones are standard, as is high-speed recue. The record amplifier features large VU meters with LED peak indicators, input level controls and a unique meter/special function panel containing controls for meter function select, 1 kHz primary tone add/defeat, cue erase and an internal test tone generator. All functions are microprocessor-controlled.

Audio inputs and outputs are XLR type, and a keyed, positive contact latching connector provides interface for the record head. A 50-pin locking connector is provided for remote control.

For more information, contact Susan O'Daniel at DRS Technologies in Illinois at (309) 662-1941; fax: (309) 662-1640, visit the website: www.itc-net.com *or* ***circle Reader Service 124.***

GEFEN SYSTEMS

Gefen Systems has a new SFX 4 CD collection called "Click Shop," a library that specializes in mechanical and other industrial effects, such as buttons, switches, beeps, clicks, hums, motors, machines and industrial backgrounds.

Click Shop also has a broader-based usage, because along with the industrial effects, the set includes effects that could be used for sci/fi, fantasy, horror and cartoon applications: squishy plops, huge rips, assorted thuds, puffs and pops, crunches and chops and wire and rope pulls.

For more information, contact Gefen Systems in California at (818) 884-6294 or ***circle Reader Service 125.***

HARRIS

The **Harris** CD 2001 CD cart machine is in its third generation. Harris has kept many features of previous models, but has made a few improvements as well.

The servo adjustment now is automatic, and the CD 2001 now contains a 16-bit microprocessor. The unit is

certified CE ready, and uses surface mount technology. A digital output via three-pin AES3 is provided, along with analog stereo.

Features standard to the CD 2001 include an autolock feature that prevents dead air, a flashing EOM (End of Message) indicator, a linear tracking system that cuts start lag time to under 200 milliseconds, and vertically mounted circuit boards with optional extender cards. The CD 2001 cues to music, and recognizes and reacts to syndicators' Index 3 subcodes. The machine can be programmed for five to 35 seconds of "early warning" endtime. CD cartridges protect the medium.

For more information, contact Harris Corp. in Indiana at (765) 962-8596; fax: (765) 962-8961 or ***circle Reader Service 126.***

HENRY ENGINEERING

The DigiCord II from **Henry Engineering** is a digital audio recorder that can record more than five minutes of audio and as many as 16 separate messages for random-access playback via remote or local control.

According to owner Hank Landsberg, the "product is widely

used for non-critical utility recording. The most common application is (as) a network news delay recorder, whereby the DigiCord automatically records an incoming network news feed ... and stores it in digital memory for delayed playback. The user presses the Start button to begin playback."

Messages can play once or repeat continuously and can be recorded from a mic, tape deck or other line-level audio source.

The DigiCord is available with bandwidth of 5 kHz or 8 kHz; and with recording time of 5 minutes 30 seconds, or 2 minutes 45 seconds.

For more information, contact Henry Engineering in California at (818) 355-3656; fax: (818) 355-0077 or ***circle Reader Service 127.***

See SOURCES, page 63 ▶

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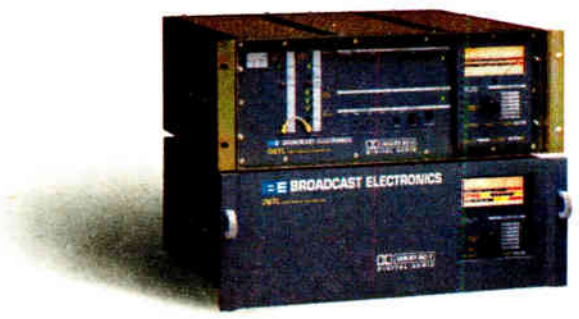

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Products & Services Showcase

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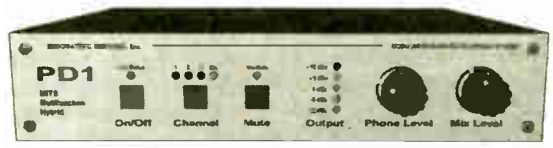

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- The Junior Audio Director™ - Stereo Mode Controller
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The Audio World Interface™ is a two-way recorder interface that is switchable to a line amp or a mono mix amp. The balanced inputs and electronic transformer outputs both have front panel recessed gain controls. The rack mountable chassis includes LEDs to indicate signal overload, switch position, and power presence.

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READER SERVICE NO. 71

World Radio History

▶ SOURCES, continued from page 61

MARANTZ

New from **Marantz Professional Products** is the CDR620 Compact Disc Recorder. The write-once CDR620 incorporates 1-bit A/D and D/A converters, a sample rate converter, digital audio delay and automatic track incrementing and indexing from

CD, DAT and MD.

It can be used alone or integrated into a digital audio workstation system through the built-in SCSI-II interface, which allows recording of data in a variety of formats, including CD-ROM (XA), CD-Photo, CD-I, Video-CD and CD-DA.

The unit also includes several user-programmable settings such as digital fade-in/fade-out with adjustable time, auto track increment level, audio delay, calibrated input sensitivity and mute time.

During recording, the CDR620 monitors and calibrates the speed and laser power to compensate for dust and fingerprints and includes adjustable level sensing or subcode sensing for accurate auto track incrementing. The CDR620 also supports manual track incrementing.

The CDR620 can be controlled via remote control and is compatible with Red Book and Orange Book specifications.

For more information, contact Superscope Technologies in Illinois at (630) 820-4800 or ***circle Reader Service 128.***

OTARI

Otari Corp. developed the DTR-8S professional DAT machine, the successor to the Otari DTR-8R. In addition to the features of the DTR-8R, the DTR-8S can monitor the input signal without requiring a DAT tape in the unit.

The DTR-8S has +4 dBu (-10 dBV switchable) active balanced analog I/O with XLR connectors and has both AES/EBU and S/PDIF digital I/O. In

search mode, the DTR-8S uses TOC information from tape to locate as fast as 300 times normal play speed. The 48 kHz, 44.1 kHz and 32 kHz sampling rates are switchable from the front panel.

Other standard features include an hour meter to help schedule maintenance, rack mount adapters, wireless remote control and parallel remote control capabilities.

For more information, contact Otari Corporation in California at (800) 877-0577; fax: (415) 341-7200, visit the website: www.otari.com *or* ***circle Reader Service 129.***

PANASONIC

The SV-3800 DAT recorder from **Panasonic** is a blend of new technology with the Panasonic SV-3700 DAT recorder.

The unit features 20-bit resolution DACs and a 1-bit, 64-times oversampling A/D converter. According to the company, the combination results in "a wider dynamic range, lower noise and greater linearity."

The SV-3800 also incorporates a 1-bit type A/D converter and high-resolution, ladder-type D/A converter, which is resistant to clock jitter. Dual DACs increase stability by processing left- and right- channel data separately.

The unit features a Single Program Play function, which plays program material to the next start ID, then stops until the play is pressed again. A Skip Play Cancel function is included. In the off position, it will cause the unit to skip unwanted portions of the tape automatically.

For more information, contact Panasonic in California at (714) 373-7277 or ***circle Reader Service 130.***

SONY

Introduced at the September AES show, the PCM-R300 DAT recorder from

Sony was designed to replace the DTC-A6 recorder and complete the PCM family of professional DAT products, which includes the PCM-R500 and PCM-R700.

The PCM-R300 incorporates much of the technology used in previous Sony DAT recorders and has new features, as well. They include a set-up menu for preference selection, which allows users to set level sync threshold, activation of Start ID transfers from DAT or CD and activation of the built-in clock. The menu also includes a switchable ID6 mode (SCMS) and an optional error readout menu.

The unit is rack-mountable and contains automatic head cleaning. It also employs Super Bit Mapping (SBM) technology, which converts the audio signal from a 20-bit resolution A/D into 16-bit signals. The audio interface includes digital I/O (S/PDIF, RCA pin) and analog I/O (unbalanced/RCA pin).

For more information, contact Sony in New Jersey at (800) 686-SONY, visit the website: www.sony.com/proaudio *or* ***circle Reader Service 131.***

Watching the Market With the Dealers

▶ TRENDS, continued from page 59

and ball games and the kind of mastering that in the past was done on reel-to-reel. At the same time, since the introduction of DAT six or seven years ago, reel-to-reel sales have dropped dramatically. Art Reed of Bradley Broadcast said, "DAT pretty much has replaced the reel-to-reel as a place to stick two tracks of audio. We sell very few reel-to-reels." At some stations, however, reel-to-reel remains in demand.

Sources of the future

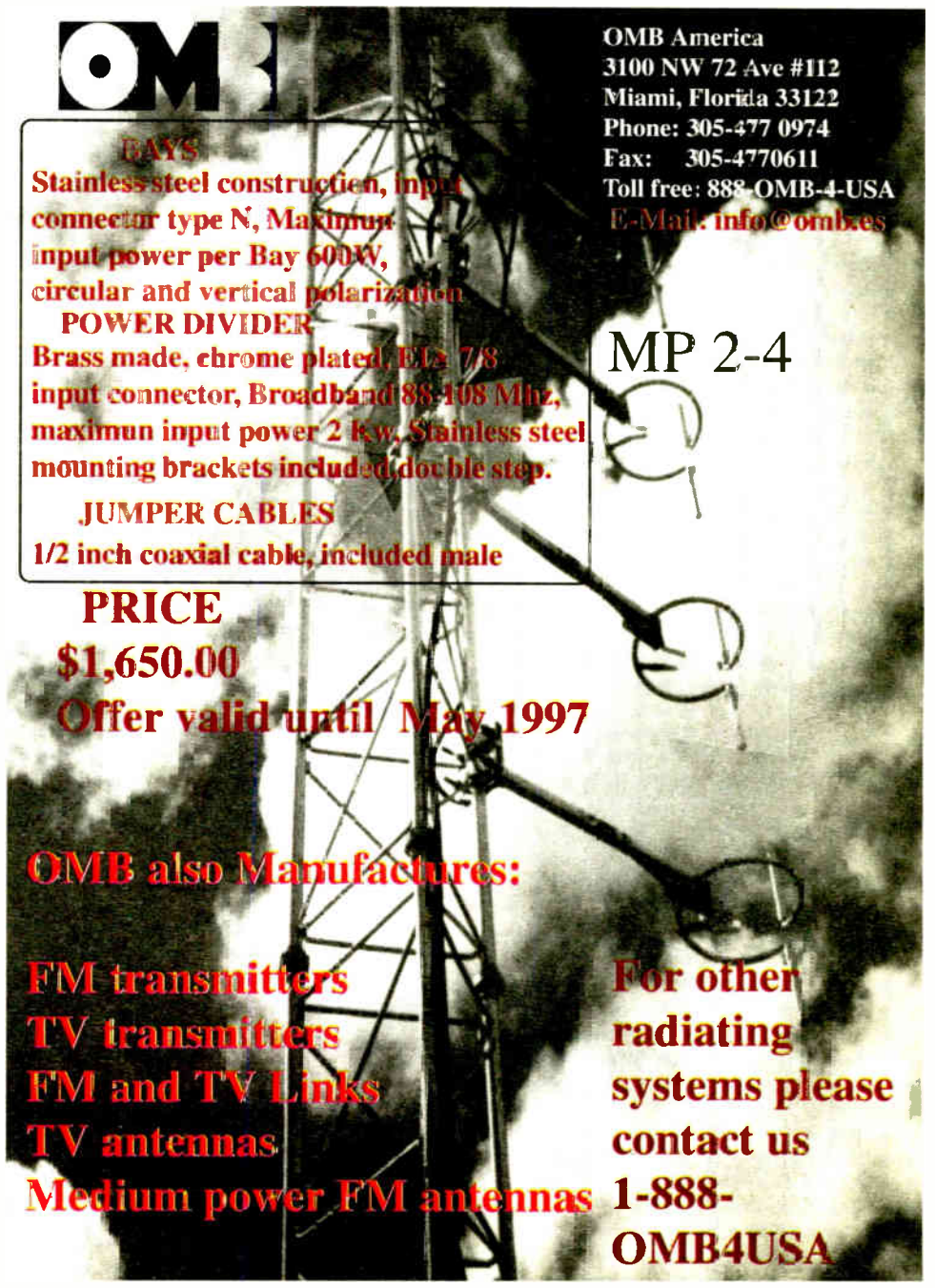
According to dealers, recordable CDs are making only a minor impact in the broadcast industry at the moment. Those who use this medium generally are buying stand-alone recorders rather than units for use with a PC, and are using them to archive music from other media.

Some sales departments use CD recorders. Schwieger said, "Some radio stations are using recordable CDs in their sales department to record commercials ... and they're giving the commercial to the client on CD."

Likewise, re-recordable CDs are making virtually no impact in the broadcast industry; the high price of the individual blanks — currently, each one sells for nearly $30 — needs to drop considerably.

At least one dealer predicts that DVD will be the next major format to have an impact on broadcast audio. "My personal feeling is that DVD will have the single most profound impact on audio as we know it for radio after the year 2000," said Schwieger. "If DVD ever gets off the ground to have it recordable, I think we will find it will replace the compact disc." With a potential of 10 gigabytes of storage, the medium offers considerable advantages. *(See related story, page 12.)*

However, as of this writing, there are no DVD recorders available and the industry has yet to adopt a DVD CD audio standard. It may be several years before DVD begins to have an impact on broadcast audio, but when it does, it may revolutionize studio audio in a manner similar to the tape cart back in the 1950s. Only time will tell if its potential will be realized.



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World Radio History

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Got a product for Marketplace? Mail info and photos to:
Marketplace, Radio World, Managing Editor, P.O. Box 1214, Falls Church, VA 22041.

AKM Semiconductor AK7712A 20-bit Codec

AKM Semiconductor introduced the AK7712A codec, which integrates a 20-bit stereo A/D, four 20-bit output D/A channels and an innovative proprietary 24-bit, fixed-point DSP. The AK7712A provides a dynamic range of 97 dB for both the A/D and D/A channels. Its DSP allows 383 instruction cycles, with as many as six operations per cycle, while operating at a 48 kHz audio sampling rate. The A/D, D/A and DSP sections are accessible independently, assuring flexibility.

The AK7712A is available in a 100 lead LQFP package, offering PC board savings when compared to discrete solutions using separate DSP, ADC and DACs.

The AK7712A can be used by designers contemplating products for the emerging DVD-ROM markets.

For more information, contact AKM Semiconductor in California at (888) AKM-SEMI, visit the website: www.akm.com; *or* ***circle Reader Service 106.***

illbruck SONEXtextile

SONEXtextile from illbruck, inc., controls noise in studios, control rooms, or any place where improvement in acoustics and appearance is desired. SONEXtextile panels combine sound absorption with special non-woven coverings. They feature fire-resistant willtec foam, a 100-percent fiber-free Class 1 building material.

The panels are 24 inches by 48 inches and come in thicknesses of 1, 2, or 3 inches. SONEXtextile panels come in a variety of colors. Sound absorption coefficients vary with thickness and frequency.

Panels that are 2 inches thick have an SAC of 0.73 at 250 Hz and 1.17 at 1 kHz. Full test data is available on request.

For more information, contact illbruck, inc. in Minnesota at 1-800-662-0032 or (612) 520-3620; fax: (612) 588-8396. Visit the website at www.illbruck sonex.com; *or* ***circle Reader Service 107.***

Sonic Foundry Acoustics Modeler

The Acoustics Modeler Plug-in software program from Sonic Foundry, Inc. adds the acoustical coloration of real environments and sound alteration devices to recorded audio. Acoustics Modeler was developed for use with any editor that supports DirectX Audio plug-ins, including Sonic Foundry's Sound Forge 4.0.

The program features acoustic signatures,

created from precise acoustic measurements. Signatures include recording studios, concert halls, warehouses, tunnels, bridges, and woods. Recorded material can be filtered through numerous sound-altering devices, such as classic microphones and instrument amplifiers. Users can also record and access their own acoustic environments with the Impulse Recovery Function, allowing the creation of unlimited acoustical signatures.

For more information, contact Sonic Foundry, Inc. in Wisconsin at (608) 256-3133. Visit the website at www.sonic foundry.com; *or* ***circle Reader Service 108.***

VIP Products Wrap-Up Wire & Cable Markers

Wrap-Up Wire & Cable Markers from VIP Products are designed to provide fast and permanent field identification. The Markers are available in widths from 1-1/2 inches to 6 inches to fit virtually any size cable or wire, and in eight colors to meet EIA/TIA606 standards.

The field technician uses a marking pen, ball-point pen or typewriter to write the appropriate legend on the Wrap-Up. When applied, the clear film of the Wrap-Up completely covers and laminates the written portion, ensuring protection against dirt, oil, and water. Wrap-Ups are available for imprinting with laser-printers, and custom Wrap-Ups may be ordered to suit any identification need.

For more information, contact VIP Products in Texas at (800) 950-4921; or ***circle Reader Service 109.***

Telebyte Technology ISDN Terminal Adapter

The Model 464 ISDN Terminal Adapter from Telebyte Technology, Inc. includes a built-in NT1 and provides 128 kbps communications links for data applications between users and remote locations.

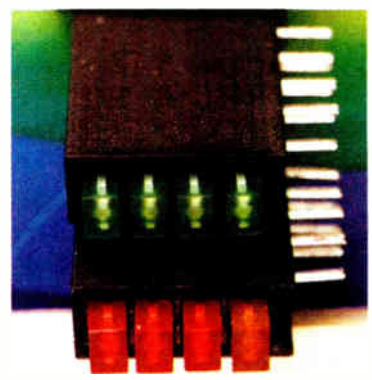
The Model 464 ISDN Terminal Adapter is designed for the single-line ISDN data transmission popular for fast Internet and remote LAN access. The built-in NT1 network termination allows direct connection to the ISDN line via the U interface, without having to purchase any additional hardware. The adapter card includes a 16-bit bus interface.

The Model 464 complies with the switching protocol of AT&T-5ESS, Northern Telecom DMS-100, and National ISDN-1/2.

For more information, contact Telebyte Technology, Inc. in New York at (516) 423-3232 or (800) TELEBYT. Visit the website at www.telbytetechnology.com *or e-mail* sales@telebyteusa.com; *or* ***circle Reader Service 110.***

Lumex Low-Profile Quad Tower LED Block

The low-profile quad LED assembly block from Lumex, Inc., measures 0.47 inches high and features rectangular LEDs.

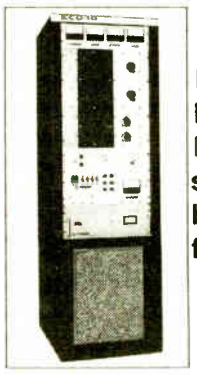


The tower shape saves space and aids board-level indication requirements in equipment such as telecom control boards and enunciator panels. Each individual LED is fully enclosed on five sides to eliminate light leakage and to make the display easier to read.

The SSF-LXH534xx series is available in many colors and color combinations.

For more information, contact Lumex Inc. in Illinois at (847)-359-2790. Visit the website at www.lumex.com, *e-mail* sales@lumex.com; *or* ***circle Reader Service 111.***

Problem:



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RTS 410 amps (2), 10 W monitor amp. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

Fostex PH-5 headphone amp, excel cond, $95; Rolls RA62HA headphone amp, perfect, $80. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

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Cablewave 7/8" transmission line, 300', $750; SWR 3-bay low pwr 3 kW antenna, 6 yrs old, $750. B Dixon, WAWC, 219-457-8181.

Collins hor 4 bay, 95.3 mHz, 40 kW rated, $300 +shpg; ERI FM-4 w/heaters, 95.3 MHz, $1500 +shpg. J Crawley, POB 185, Cambellsville KY 42719. 502-465-8884.

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CP 6-bay FM antenna at or near 98.5 MHz. B Campbell, KACO, 720 N Commerce, Ardmore OK 73401. 405-226-9850.

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Sansui AU-555A amp, 2 phono inputs, $40; Sansui SE-300 graphic EQ, $25. E Ribner, Sounds That Matter, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

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Alesis Q2 processor, like new, $339. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

ESE ES302 up/down rack mounted timer, $150. P Cibley, Cibley Music, 166 E 35th St, NYNY 10016. 212-532-2980.

Micro FX NR units (6), vgc w/rack adapters, $40 ea. C Yengst, WAWZ, Weston Canal Rd, Zarephath 08890. 732-469-0991.

UREI 535 dual 10 band graphic EQ, needs work, $100. J Borden, Handbasket Prod, 2909 S Logan Ave, Milwaukee WI 53207. 414-482-8954.

Tannoy 15" speaker pair, newly recond, $1450; vintage recond tube mic pre's & mixers, $300-$700; new ADC patch bays 1/4" 52 points, $169; ADC TT bays, $129 up; new ADC TT or 1/4" TRS cords, $9; Furman 1/4" to 1/4" patchbays, $95 ea; like new tape, 1/2"x2500' 456, $15 ea; 1" 456, 226, 250, $25 ea; Digitec 3.6 sec delay, $150; new pwr dist/filter rack mt, $75. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

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Langevin, Flickenger, WE, RCA mic pros, etc. B Gilliott, Showplace Studios, 347 S Salem, Dover NJ 07801. 201-328-4400.

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Compressors & EQs, tube and solid state. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

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Digilink II version 3.0, new 1.6 gig hard drive, new pwr supply, presently on-air, $2000; Digilink CD multiplay controller, w/6 used PD-TM3 18 CD players, 2 new PD-TM3 18 CD players & 5 used PDM-501 or PDM-551 6 CD players, presently on-air, $2000. B Dixon, WAWC, 219-457-8181.

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KRRI-FM Las Vegas, 24 Hr Schafer System for sale. Rack mounted except as noted. Includes: Main Brain; 6 Elevator Audiofiles: 1 Backup Brain for spare parts; 10 Free Standing Audiofiles; $1000 worth of new spare parts; 901 System Engineering books, $1500 +shpg, excellent condition, first come first served. Call Art Kevin: 702-592-5899 or E-mail: radioart@ix.netcom.com

Arrakis Digilink GEM-600 Gemini System w/1.2 gig + network board & software, w/cart wall; Arrakis TS-8C Trak Star workstation w/270 MG w/network board & software, units are 1 yr old, currently on air & working, $11,500/BO. L Zeve, WHYL, Box WHYL, Carlisle PA 17013. 717-249-1717.

Digital Automation: RDS Phantom digital automation system: with rack mount, 486DX/33PC, 4MBRAM, (2) 1GB HDD's, relay I/O card, (2) Antex sound cards, RDL stereo switcher, 4 port Cybex PC Expander, (3) Cybex remotes, (3) VGA monitors and keyboards. Perfect for satellite delivered format. In excellent condition, $10,000 or best offer. Tony Mullins, 910-342-3853.

Want to Buy

Automation system for FM broadcaster, used or barely used, complete & ready to install, 2 chnl, sat u/l-d/l, live-assist, full auto, documentation, need one, will consider package. C Slacke, WCPE, POB 828, Wake Forest NC 27588. 1-919-556-5178. Cslacke@mindspring.com

BUSINESS OPPORTUNITIES

Want to Sell

Cutting Edge Unity 2000I digital bdct processor w/software for PC control, $3500/BO. G Morrill, Box 973, Bay City MI 48707. 517-892-9700 ext 120.

CART MACHINES

Want to Sell

BE triple deck w/record electr for deck 3, mono w/3 cue tones, excel cond, $1200. B Hineman, The Sound Man, 2673 Glengyle Dr, Vienna VA 22181. 703-242-7497.

Great Prices on original equipment tape heads for ITC, BE, Fidelipac, Otari, Tascam & others!
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Pacific Tomcat, rack mount, PB, stereo cart deck, excel cond, $100. W Jackson, Broadcast Productions, 1520 University NE, Albuquerque NM 87102. 505-848-8391.

ITC SP cart deck, $75 +shpg. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

ITC upgrade PB to record, amps only-no deck, 3 tone, stereo, $175. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

CONSOLES

Want to Sell

Howe 12 pots, $1500. J Arzuaga, WLAZ, Curry Ford Rd, Orlando FL 32812. 787-895-0000.

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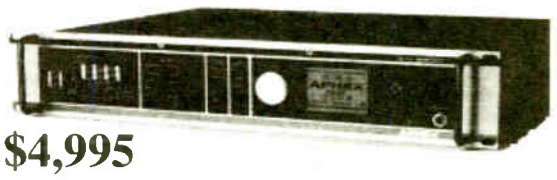
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CONSOLES continued...

Dynamax MXIZL, like new, $3800; Dynamax S-MX semi/fuse kit, excel, $45; Dynamax test extender TE-M, perfect, $25; Dynamax MAN-MX tech manual, excel, $20; Yamaha MC1604II, perfect, $220. J Coursolle CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

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Instatape 1080 8 chnl mono board w/3 auxillary chnls, $150 +shpg. J Reed, Exceptional Entertainment, POB 285, Oaklyn NJ 08107. 609-858-3666.

Mackie 1202 VLZ, 4 mono, 4 stereo, like new, $260; Mackie 1202, like new, $185. R Forsythe, Forsythe/Hines, 59241 Overseas Hwy #99, Marathon FL 33050. 305-743-3503.

Sony MXP 2026 24x4x2 w/18 mono, 6 stereo modules, 4 comp/lim, $28K; MBI Series 24 on-air console 12x2 w/10 stereo, 2 mono modules, PPM meters, P&G faders, $7K; Ward Beck 20x4x2 w/4 comp/lim, P&G faders & patchbay, $8K; Studer A80RC 1/4" stereo, $2K; Ampex ATR 104 1/2", $2.5K. M Valovsky, Eurosound, 1101 Atlantic Ave #1, Waukegan IL 60083. 847-249-3467.

Yamaha 1242 12 chnl 4 group stereo, '93 mdl, mint cond, $850. M Middleton, WQRX, POB 309, Valley Head AL 35989. 205-635-6284.

Soundcraft 600 32x16 w/patchbay, mint, $4950; Tascam 512 12x8 mixer, $750; Tascam 520 20x8x16 mixer, $1750; Tascam 30 8x4, $450; Allen & Heath Syncon 28x24, great sounding, $5000. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

DISCO-PRO SOUND EQUIP

Want to Sell

Nady 2 chnl wireless rcvr w/2 wireless mics, excel cond, BO; Nady WA150 50 W small wireless PA system w/speaker, amp/rcvr & mic, works on 110V AC or 18V DC, BO. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

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Texar Audio Prisms (2) clean w/manual, $1400/pr. B Hawkins, WENS, 950 N Meridian St #1297, Indianapolis IN 46204.

CBS FM Volumax 410, $40 +shpg; AM 864/U voice freq, tube limiters, $35 ea or $125/all +shpg. J Crawley, POB 185, Cambellsville KY 42719. 502-465-8884.

Orban 8200ST studio processor, like new, $999. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

Want to Buy

UREI, dbx, WE, Gates, Collins, Altec, all tube types, etc. J Phillips, The Great Wireless Talking Machine Inc. 419-782-8591.

Collins, RCA, WE, Flickenger, Orange County, AOR. B Gilliott, Showplace Studios, 347 S Salem, Dover NJ 07801. 201-328-4400.

Teletronics or UREI LA 2, 3, 4, 1176, Gates, RCA, dbx (160-165), Altec, Collins. T Coffman, Rolltop Studio, POB 17203, San Diego CA 92177. 619-571-5031.

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, 972-271-7625.

MICROPHONES

Want to Sell

EV RE20 (2), reconditioned at the factory. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

Nady 49HT wireless mic & rcvr, $75; Shure 545-D Unidyne III, $35; Superscope EC-3 cardioid condenser mic, $15; EV 645-TR noise-cancelling telephone handset mic, $20; EV RE-50, $70; EV 635A, $40. E Ribner, Sounds That Matter, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

Neuman U87A, $1500. J Arzuaga, WLAZ, Curry Ford Rd, Orlando FL 32812. 787-895-0000.

Advantage One bi-amp 8 chnl mixer, $375 +shpg; Shure SM 59, $125; Sennheiser ECM10, $130; EV 635A, $140. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

EV RW20, perfect, $295; EV 309A mic shockmount, perfect, $65; Telex V220 sportscaster headset w/cord, XLR plug, excel, $145; OC White M2MDUR mic arm/R, excel cond, $65; Symetrix 528E mic processor, perfect, $285. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

RCA 77DX & 44BX mics completely refurbished. P Hayes, TCC Productions, 6327 Bahama Shrs Dr So, St Petersburg FL 33705. 813-867-8330.

Shure SM7, like new, $220; Sennheiser MD421, gd cond, $180. R Forsythe, Forsythe/Hines, 59241 Overseas Hwy #99, Marathon FL 33050. 305-743-3503.

Valley 400 mic processor, excel cond, $150. M Middleton, WQRX, POB 309, Valley Head AL 35989. 205-635-6284.

RCA 77DX, BK1A, $395; vintage PA mics, Shure 51 Elvis, $75, EV731, $95, EV 630 or 635, $75, RCA mini 77" shaped, $295. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

Want to Buy

RCA, Neumann, WE, all types, on air lights, etc. J Phillips, The Great Wireless Talking Machine Inc. 419-782-8591.

Broken E-V RE-20/PL-20 mics for parts. D Rumble, Toursound, 2918 N 47th Dr, Phoenix AZ 85031. 602-272-4724.

RCA 77 & 44 or other ribbon mics, dynamics & tube mics. T Coffman, Rolltop Studio, POB 17203, San Diego CA 92177. 619-571-5031.

Neumann, Sennheiser, AKG, many models. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

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RCA 77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights. Top price paid. Fast response. Bill Bryant Mgmt, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131, FAX: 615-292-3434.

MISCELLANEOUS

Want to Sell

Female-to-female XLR adapters (3), $15; (2) _" splice blocks, $25; cassette splice block, $10; discfeet, $5; (12) music DeWOLFE LPs, gd cond, $20. E Ribner, Sounds That Matter, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

New style on-air signs (2), excel cond, BO. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

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STL MA-23CC & 1000' dbl shield coax; QRK tables; Scully tape decks/amps; Gates automation & decks; amps; PC data rcvrs, BO. S Weber, KWVA, POB 453, Oakridge OR 97463. 541-782-2901.

Blank metal base recording disks for record cutters (50), $200. C Collins, Grunert Sound, 1977 S 74th, Milwaukee WI 53219. 414-327-4141.

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World Radio History

MISCELLANEOUS continued...

Eventide BD500, perfect, $1795; ESE ES185 GPS/master clock, perfect, $1575; ESE ES161A slave clock, perfect, $140; ESE ES166A slave clock, perfect, $198; Gentner TS612 6 line/exp, w/screenware pkg, excel, $2000; Gentner TS 612 network interface, excel, $275; Gentner TS612 control surface, excel, $275; Telos One 120-1 hybrid w/rack mount, excel, $410; Best UPS L1 3KL, $1275. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

Industrial Acoustic voice over booth, new, $900 +shpg; Grim audio patch bay, new, $120. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Onan OT225 automatic transfer switch, 240 V, 3 phase, 100 kW, new in crate, $2500. S Swanson, KBNL, Box 440029, Laredo TX 78044. 956-724-9211.

CBS or NBC call-letter plate for RCA44 & Altec-Lansing 639A mics. M Harrington, POB 250995, Little Rock AR 72225.

Yamaha BP-2 bass pedals. B Meuse, Muse Audio Arts, 600 Rainbow Dr #107, Mtn View CA 94041. 650-969-2433.

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.

MONITORS

Want to Sell

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RECEIVERS & TRANSCEIVERS

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Motorola Moxy high band 2-way mobile radio, $40. K Starcher, 1570 Meriline, Cuyahoga Falls OH 44221. 330-920-8035.

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Vertex FTH-7009 (4) 5 W UHF hand helds, 6 chnl PI, programmed for you with chargers, 450-470 MHz, $500/all. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

RECORDERS

Want to Sell

Marantz PMD 220 prof 3 head, mono, 2 speed, portable cassette rcdr, excel cond, $175. S Barker, KAK Productions, 1994 Sillick Terr, Santa Rosa CA 95404. 707-528-4055.

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Sony TC-153SD portable cassette rcdr, mic inputs, Dolby B, service manual, $75; Vector Research VCX-500 cassette deck, worn heads, $35. E Ribner, Sounds That Matter, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

Ampex AG 440 - 2, rack mount, gd cond, $500. B Lindahl, Lindahl Studios, 10680 SW Wedgewood, Portland OR 97225. 503-644-9643.

Dynamax CTR10 cart rcdr, vgc w/manual, $750; ITC cart player, vgc w/manual, $200. C Yengst, WAWZ, Weston Canal Rd, Zarephath ME 08890. 732-469-0991.

Otari 5050, $1800 +shpg. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Otari MX5050 2 trk, sounds great, gd cond, $800. R Forsythe, Forsythe/Hines, 59241 Overseas Hwy #99, Marathon FL 33050. 305-743-3503.

Revox B77 1/2 trk r-r w/manual, excel cond, $650. D Brou, KRVV, 212 Wainwright, Pineville LA 71360. 318-445-4843.

Revox PR 99 PB deck & stand, $500. F Ferreri, WLYU, 6214 Springer Dr, Port Richey FL 34668. 815-845-1063.

Tandberg Series 64X 4-trk stereo, tube electr r-r, $125. J Borden, Handbasket Prod, 2909 S Logan Ave, Milwaukee WI 53207. 414-482-8954.

Tascam 32 r-r, perfect, $1375; Panasonic DAT SV-3700, excel cond, $600; Marantz PMD-222, R/P XLR, 2 sp, in in/out, perfect, $300; Telex ACC-4000 duplicator, perfect, $1800. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

Tascam 48 .50/inch r-r 8 trk w/8 chnls dbx, manual, tapes, $1500. J Borden, Handbasket Prod, 2909 So Logan Ave, Milwaukee WI 53207. 414-482-8954.

Tascam DA-88, very low hrs, w/12' XLR cable, $1800; Otari MX-5050 MK III-4, 1/2" 4 trk, overbridge, wheels, $600. G Hansuld, Act Radio, 301 Merritt, Norwalk CT 06851. 203-840-5767.

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New & used Ampex 350 style tape transports, motors & parts, various prices. M Crosby, 408-363-1646.

Otari 5050BII (2), mint, #1200, gd, $800, portable case available. Redco Audio, 1-800-572-7280.

Tascam ATR60-2, in stand, $1200; Tascam 58, 8 trk, $1950; Tascam 38 8 trk, $1650; Otari 5050-8 Mk III, $1900; Ampex 1200 PURC cards (5), $125 ea; Custom locator for any deck, $495; Sony 2 trks, $195 ea. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

Want to Buy

MCI JH-110, will pay fair price for capstan motor for 1" 8 trk. J Borden, Handbasket Prod, 2909 So Logan Ave, Milwaukee WI 53207. 414-482-8954.

Stellavox recorders/parts. C King, King Audio, POB 116, E Berlin CT 06023. 860-665-2881.

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

Ampex machines, recorder electronics, mixers. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

REMOTE & MICROWAVE

Want to Sell

Burk TC-8 w/67 Hz subcarrier & new relay panel, $1800. J Arzuaga, WLAZ, Curry Ford Rd, Orlando FL 32812. 787-895-0000.

Gentner VAC2000 w/ready panel, VAC 1000 cable, AGC panel (2), $2000. B Strand, KWXD, 1604 E Quincy, Pittsburg KS 66762. 316-232-5993.

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Marti M-30B, (2) xmtrs, (2) mic inputs, $125 ea; Wegener 1601-50 ST5 RX main frame sat rcvr, $200. M Williams, WMBH, 2510 W 20th, Joplin MO 64801. 417-781-1313.

Moseley 1620 xmtr remote control studio & xmtr units w/modem & Taskmaster software; Marti RPT xmtr 2 chnl battery operated or 110V, 2 inputs; Telos 10 digital telephone interface. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

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Comrex LTX/R (2), $700 ea; US Audio Whirlwind Mix-5S stereo mixer, $225; SKB rack-mount case-4 unit, $120, excel cond. K Starks, The Voice Box, 313-480-9981.

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Comrex Nexus ISDN, perfect, $1350; Comrex Codec Buddy, perfect, $1200; Comrex DXP.1 G.722, excel, $950; Comrex TCB-1A telephone coupler, excel, $95. J Coursolle, CRMC, 2401 W Waukau Ave, Oshkosh WI 54903. 920-238-4242.

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Consoles
Disco-Pro Sound Equip.
Financial Services
Leasing
Limiters
Microphones
Miscellaneous
Monitors
Receivers & Transceivers
Recorders
Remote & Microwave Equip.
Repair Services
Satellite Equipment
Software
Stations
Stereo Generators
Tapes, Carts & Reels
Tax Deductable Equipment
Test Equipment
Transmitter/Exciters
Training Services
Tubes
Turntables
Positions Wanted
Help Wanted
Classified Advertising Rates Effective January 1, 1997

	1x	3x	6x	13x
1-9 col inch (per inch)	$69	66	61	55
10-19 col inch (per inch)	$52	59	55	50
Distributor Directory	$105	100	95	90
Professional Card	$74	68	62	56
Classified Line Ad			$2.00 per word	
Blind Box Ad			$15 additional	

To compute ad costs: Multiply the number of ad inches (columns x inches) by the desired rate schedule for your per unit cost. Example: a 3" ad at the 1x rate is $207, at the 3x rate $195, at the 6x rate $183, at the 12x rate $165, etc.

World Radio History

REMOTE continued...

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Gentner E&F 900A single line freq extender, send & receive w/pwr supply, $400. J Felz, KLTX, 701 N Brand Blvd, Glendale CA 91203. 310-546-6451.

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Hotlines — FM Exciters
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Marti RPT-15 remote xmtr & rcvr, 455.1175 solid state, $800/firm. D Doelitrsch, WFRX, POB 1888, Marion IL 62959. 618-997-8123.

MCI STL xmt & receiver, 2 dishes, 215' transmission line, $3500. H Morgan, WHJM, 802 S Central Ave, Knoxville TN 37902. 423-546-4653.

Modulation Sciences composite line drivers (2) CLD 2501 & CLD2502, $900/set or $1700/all. B Landry, WWL Radio, 1450 Poydras St, New Orleans LA 70112. 504-593-2107.

Moseley MRC-1600 (2), vgc w/manuals, $1800/both. C Yengst, WAWZ, Weston Canal Rd, Zarephath ME 08890. 732-469-0991.

Gentner VRC-2000 with command relay unit, remote control unit, and interconnection unit for remote control transmitter operation, with operation manual. In excellent condition, currently in use, $1500.00 or best offer. Tony Mullins, 910-342-3853.

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Circle (230) On Reader Service Card

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Circle (231) On Reader Service Card

HTS Premier 70 w/descrambler & antenna relocator. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

MRP-1 Cue Command decoder for ABC stations, $200/BO. 1-770-614-0721.

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Want to Sell

Low pwr FM station in Southern Ohio area, operates under part 15 of FCC R2R, equipment only, must move station. Fax replies to 614-775-4954.

500W daytimer licensed to Pawhuska OK, studios in Bartlesville, $50,000, terms to qualified buyers or $40,000 cash. B Campbell, KACO, 720 N Commerce, Ardmore OK 73401. 405-226-9850.

10K AM in North Central AZ. 520-774-0864.

AM, fulltime, Central Georgia. Cheap! Group deal. 912-765-8166 (pager).

Rebuilt Radio Stations in Southern Louisana (new tower, antenna, transmission line, transmitter & processor), FM & AM, will lease or sell with financing. 804-272-7101 or (pager) 888-948-0521.

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Want to Sell

Standby Generator, Empire 150 KW Cummins diesel engine, 1000 hours 120/208 volt or 277/480 volt, batteries, charger & muffler, $9,750. K.P. Polly, 573-474-4334.

TAPES/CARTS/ REELS/CD'S

Want to Sell

Assorted cart racks, in gd cond, many new, BO; Fidelipac carts, gold & grey, gd cond, $1 ea. C Yengst, WAWZ, Weston Canal Rd, Zarephath ME 08890. 732-469-0991.

Fidelipac Dynamax Type AA, approx 3000 cartridges, various lengths, $1000. F Ferreri, WLYU, 6214 Springer Dr, Port Richey FL 34668. 815-845-1063.

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Records, Adult Contemporary format on 76 10.5" reels; **Music Library** digitally recorded on 172 CDs of the greatest standards of the past 50 yrs by original artists, complete buy-out basis, for radio use only. J Gelo, 941-642-6899.

Microtran table top tape degausser, handles 1"-2" tapes, $150/BO; mechanical tape timers, Lyrec & Seike/Spotmaster, new & used. M Crosby, 408-363-1646.

Tektronix 508 1Ghz counter, $500; Tektronix 501A 2 MHz function gen, $200; Tektronix DC502 freq counter, $200. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Tektronix 7633 dual trace oscilloscope, 7A26 & 7B53A plug-in units, gd cond, $600. B Lindahl, Lindahl Studios, 10680 S W Wedgewood, Portland OR 97225. 503-644-9643.

Want to Buy

Heathkit IO-10 small portable tube type oscilloscope from late 1960s. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

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Circle (224) On Reader Service Card

TUBES

Want to Sell

Svetlana ELECTRON DEVICES
Quality Power Tubes

300B (See SV300B)	3CX10,000H3	4CPX800A	5CX1500B	SV572-3
3CX300A1	3CX15,000A3	4CX1500A	572B	SV572-10
3CX400A7	3CX15,000A7	4CX1600B	6550C (See SV6550C)	SV572-30
3CX2500A3	3CX15,000H3	4CX3500A	6AS7G	SV572-160
3CX2500F3	3CX20,000A7	4CX5000A	6BM8	SV6550C
3CX2500H3	3CW20,000A1	4CX5000R	6D22S	SV6L6GC
3CX3000A7	3CW20,000A7	4CX7500A	6L6GC (See SV6L6GC)	SV811-3A
3CX3000F7	3CW20,000H3	4CX10,000D	6N1P	SV811-10
3CX4500F3	3CW20,000H7	4CX12,000A	811A	TH5-4
3CX6000A7/YU148	3CW30,000H3	4CX15,000A	812A	TH5-6
3CX10,000A3	4CX250B	4CX15,000J	833A	TH6-3
3CX10,000A7	4CX250BC	4CX20,000A	8161R	TH6-3A
	4CX250BT	4CX20,000B	8560AS	YC130/9019
	4CX250R	4CX20,000C	EF86	SK300A
	4CX350A	4CW10,000A	EL34	SK1300
	4CX350AC	4CPW10,000R	EL509	SK1320
	4CX400A	4X150A	SV83	
	4CX800A	5CX1500A	SV300B	

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Circle (229) On Reader Service Card

TEST EQUIPMENT

Want to Sell

Sencor SL750I TV-FM signal level meter w/access, 2 yrs old, $600. AJ Anello, Anello Tech, 1809 E 4th Ave, Tampa FL 33605. 813-241-2217, between 3-6PM EST.

B&W Model 400 dist analyzers, (2) w/copy of manual, gd tubes, $35 +shpg. J Crawley, POB 185, Cambellsville KY 42719. 502-465-8884.

HP 1704A 100 MHz scope w/probes, $700 +shpg; Rockland single chnl real time spectrum analyzer, $950 +shpg; HP 8444A tracking gen, $1200 +shpg; HP H382A variable attenuator, $450; **New 4-125A**, 2C43, 7289, 7077; used 5894, 4 X 150, 6970, many others, mostly TV & audio, new & used. Bob, 916-273-9679.

EIMAC, RCA, AMPEREX, 3-500, 3CX1500A7, 4-400, 4X150A, 4CX250B, 572B, 807, 833C. Westgate 800-213-4563.

REBUILT ELECTRON TUBES
Partial List: 6623, 23791, TH150, 6425F, 6427, 8550, 6804, 6696, 6697, 5681, 5682, 5671, 7804, 3CX10,000H3, 3CX20,000H3, 4CX5000A, 4CX35,000C
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World Radio History

TUBES continued...

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TRANSMITTERS

Want to Sell

Aphex Type III, $400. J Arzuaga, WLAZ, Curry Ford Rd, Orlando FL 32812. 787-895-0000.

NEC HPA4536B FM exciter w/built in stereo gen, freq agile 50 W; Henry 100D-95 FM amp/xmtr tuned to 95.5, excel cond. H Holzapfel, Westar Bdctg Group, 19201 Seventh St East, Sonoma CA 95476. 707-938-1775.

CCA AM250D 250 W on 1550 kHz, spare modulation transformer, $1000 FOB or you pick up; Wilkinson FM-2500E xmtr on 95.3 MHz, some spare transistors, $5000/firm, you pick up. J Crawley, POB 185, Cambellsville KY 42719. 502-465-8884.

CCA FM12000G3 xmtr w/60 W exciter, current mdl, less than 2 yrs, BO over $20,000; Marti RPU-30 xmtr & mdl DR rcvr, 166.25 MHz, $1850; Scala STL receive line amp, $300. B Walters, WASE, POB 2087, Elizabethtown KY 42702. 502-766-1035.

Gates BC5P 5 kW xmtr, 1 kW cutback, solid-state rectifiers, no PCB's, custom 2 tube PA modification, custom solid-state audio driver stage, new mod xfmr, wired for remote control, some spare parts, met NRSC proof, on 1050 kHz, working when removed from service in 5/97, $2000. L Knight, KORE, 2080 Laura St, Springfield OR 97477. 541-747-5673.

(2) Harris C-Quam AM stereo exciters. Like new condition, all manuals, etc, $1000 each or best offer. Call Mark 1-800-750-1071 leave message.

(4) Harris SX _.5/5 KW status/multimeter boards, all current revision, all working. Call Mark 1-800-750-1071 leave message.

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200 Watt	$9,874	4KWatt	$20,741
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20 KW	FM	1977	RCA BTF 20E1	5 KW	AM	1982	Continental 315R-1
20 KW	FM	1973	Collins 831G	50 KW	AM	1978	Continental 317C-1
20 KW	FM	1972	CCA FM20,000DS	50 KW	AM	1981	Continental 317C-1
20 KW	FM	1978	Harris FM20K	50 KW	AM	1981	Harris MW-50B
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World Radio History

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FILLED

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POSITIONS WANTED

Local weather for your area, accurate dependable, faxed, digital, zipped, low rates, also do voice overs, jingles, etc. Chris 606-293-2341 or e-mail wx1534@aol.com.

PT on-air or prod or writing, any shift, small/med station, Philadelphia area only, exper in producing, V/O, newscasting. Demo's & resume avail. Bob, 215-745-0754.

Reasonably priced, many yrs exper, good pipes, creative, news anchor/producer, prod voice talent, AT for adult standards. Alex, 513-777-8423.

30 yr pro seeks small market mgmt opportunity in SE, broad knowledge, creative, organized, high integrity. Potential, POB 14706, Greenville SC 29610.

Chief Engineer waiting to make FM station worries go away. Love clean powerhouse audio, music, penetrating RF. 1-904-467-3122 or mychucky@funport.net

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Voiceovers for commercials, jingles, liners, etc, low rates, 8 yrs exper, currently at large market top 40 station. Chris, 606-293-2341.

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. Simply send your listings to us, following the example below. Please indicate in which category you would like your listing to appear. Mail your listings to the address below. Thank you.

Please print and include all information:

Contact Name _____

Title _____

Company/Station _____

Address _____

City/State _____

Zip Code _____—_____

Telephone _____

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

I would like to receive or continue receiving **Radio World** FREE each month. ❑ Yes ❑ No

Signature _____ Date _____

Please check only one entry for each category:

I. Type of Firm

- ☐ D. Combination AM/FM station
- ☐ A. Commercial AM station
- ☐ B. Commercial FM station
- ☐ C. Educational FM station
- ☐ E. Network/group owner
- ☐ F. Recording Studio
- ☐ K. Radio Station Services
- ☐ G. TV station/teleprod facility
- ☐ H. Consultant/ind engineer
- ☐ I.Mfg, distributor or dealer
- ☐ J.Other _____

II. Job Function

- ☐ A. Ownership
- ☐ B. General management
- ☐ C. Engineering
- ☐ D. Programming/production
- ☐ G. Sales
- ☐ E. News operations
- ☐ F. Other (specify) _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange
PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

ADVERTISER INDEX

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Radio World assumes no liability for inaccuracy.

Page No.	Advertiser	Reader Service No.
10	360 Systems	29
43	AEQ	79
36,37	Arrakis	74
8	ATI	28
60	Audio Broadcast Group	100
12	Audio Precision	30
13	Audio Processing Technology(APT)	54
2	Audioarts Engineering	151
71	Auditronics	104
65	Auralex	234
41	Autogram Corporation	118
20	BDI	24
22	Belar	59
62	Benchmark Media Systems	117
15	Bradley Broadcast	31
44	Broadcast Electronics	80
55	Broadcast Electronics	—
57	Broadcast Electronics	—
59	Broadcast Electronics	—
61	Broadcast Electronics	101
42	Broadcast Press	—
62	Broadcast Tools	68
22	BSI	35
29	BSW	63
4	Burk Technology	
35	Cartworks/DBM	73
41	Circuit Werkes	21
3	Clark Communications	26
48	Coaxial Dynamics, Inc.	18
46	Computer Concepts Corp.	82
7	Comrex	27
41	Comrex	94
11	Continental Electronics	53
69	CPI	228
54	Crown Broadcast	89
30	Crown Satellite	39
23	Cutting Edge	—
25	Cutting Edge	37
16,17	Dalet	56
40	DB Elettronica	77
48	Econco	91
69	Econco	227
33	Enco Systems	41
21	Energy-Onix	34
64	Energy-Onix	98
69	Energy-Onix	225
38	ERI	95
62	Excalibur Electronics	19
6	Factory Direct Sales	50
31	Full Compass Sound	40
50	Gentner	85
58	Gentner	103
51	Ghostwriters	42,115
20	Gorman-Redlich Mfg. Co.	120
51	Grace Broadcasting	—
62	H.L. Dalis	92
65	Hall Electronics	233
38	Halland Broadcast	143
1	Harris	25
18	Harris	32
24	Harris	60
41	High Speed Networks	45
62	Innovative Devices	46
38	Innovative Devices	43
64	Inovonics	99
48	J Squared Technical Service	93
65	J&I Audio/Video	232
39	Modulation Sciences	75
41	Modulation Sciences	69
56	Musicam USA	97
45	Neutrik	78
20	Nott Ltd.	48
63	OMB Transamerica	102
14	Omnitronix	55
21	Orban	58
28	Orban	62
47	Otari	169
41	PAS	20
68	Pikes Peak Satcom	230
19	Potomac Instruments	57
49	PR&E	84
27	Prism Media Products	38
20	PTEK	144
39	QEI	76
51	Radio Spirits	87
52	Radio Spirits	86
20	RDL	23
41	Reach Satellite Systems	66
68	RF Power	224
20	S.C.M.S., Inc.	96
68	Satellite Systems	231
26	Scott Studios	61
20	Shively Laboratories	72
34	Sierra Automated Systems (SAS)	65
41	Silicon Valley	70
19	Sine Systems	33
62	Spacewise Broadcast Furniture	67
62	Stephens Communications	71
68	Svetlana Electron Devices	229
53	Tascam/TEAC America	88
9	Telos Systems	52
51	The Radio Mall	116
69	Transcom Corp.	226
38	Universal Electronics	22
38	Videoquip Research	47
72	Wheatstone	105
32	Whirlwind	64
38	Zercom	119

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