On the Air
With the New York
Philharmonic
See page 53.

Radio World®

Vol 20, No 22 | Radio's Best Read Newspaper | October 30, 1996

Live Radio Broadcasts Add Luster

by Chris Hamaker

LOS ANGELES Talk radio fans got their fill at the NAB Radio Show, as Westwood One continued live broadcasts of some of its most popular programs.

Government, comedy and the politics of love were among the specialties of this group of entertainers.

"All the important decision makers attend the NAB Radio Show," said Larry Kahn, director of talk programming at Westwood One. The live broadcasts are "a good way to affiliate the show," he said.

Liberal and conservative slants on issues of the day were advocated by Tom Leykis and G. Gordon Liddy, respectively.

Leykis got a head start on day one of the show as he alone broadcasted from the lobby of the Biltmore Hotel.

The Leykis show recently lost

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Digital Tools Dominate WME

by Paul J. McLane

LOS ANGELES If you listened closely as you walked the Radio/Audio Exposition floor at World Media Expo, you could almost hear the drumbeat of change, as radio and audio professionals explored new ways to create and distribute quality audio — around their facilities and across oceans.

The exhibits reflected some powerful trends: the impact of the Internet, the explosive growth of affordable digital technology and the torrent of station consolidation brought on by the Telecommunications Act of 1996.

Proponents of audio streaming technology say such systems will change the way broadcasters interact with their audiences, through real-time "netcasting," and also allow nonreal-time distribution of spots and other material.

The hotly contested battlefield of digital audio delivery via the Internet tumbled onto the exhibit floor, where Progressive Networks demonstrated its new RealAudio 3.0, and where Telos Systems showed Audioactive a new, live audio streaming technology for the Internet.

"I think people are going to be blown away when they hear this," said Telos President Steve Church. "We're going to demonstrate that audio on the Internet can have quality that rivals traditional broadcasting."

The Internet was a powerful presence at WME. British Information Services introduced Newsbreaks from Britain, which allows users to download the Radio Newsbreak service "live" in the United States.

Radio Data Group Inc. told visitors about its AdNext software, designed for radio and TV stations to manage, control, bill and track banner ads sold on Web sites, and to keep track of ad viewers.

Tapscan Inc. touted Tapconnect, a private and secure environment to send e-mail, data

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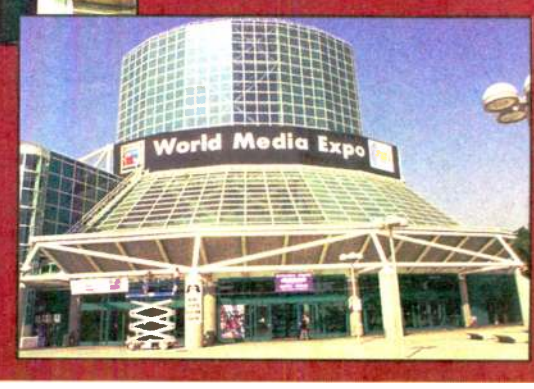
Jon Young sets up Arrakis exhibit.

Workers hang Radio Show banner.



16,278 Strong

For more WME coverage, see page 17.

FCC Prepares to Issue New AM Allotment Plan

by Lynn Meadows

WASHINGTON The Mass Media Bureau is proposing that the Federal Communications Commission (FCC) release a list of stations eligible to move to the AM expanded band between 1610 and 1700 kHz.

This will be the third list in three years. When the first was issued in October 1994, petitions for reconsideration stalled its adoption. As a result, in the fall of 1995, the FCC accepted comments on how it should modify the allotment procedures as well as what modifications it should make to its AM database which dates to 1993.

Four stations sent in suggestions and the FCC ran its computer program again releasing a second allotment plan in March 1996. Within the month, eight petitions for reconsideration were submitted.

"It is our view that several of those petitions raise legitimate concerns," said Peter Doyle, acting assistant chief of the Audio Services Division.

Comprehensive review

One of those concerns, said Doyle, related to the preclusion program which decides what frequencies are available for each station interested in migrating. Another concern was whether the program that generates the allotment plan gave first priority in every case to the stations with the greatest improvement factors.

Doyle said the Audio Services Division has completed a comprehensive review of the elements of the computer programs used to generate the list and has taken steps to perfect

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NEWSWATCH

Guide for Chief Operators

WASHINGTON The NAB recently published a comprehensive, updated edition of "The NAB Guide for Broadcast Station Chief Operators," written by Harold Hallikainen, who also writes for RW.

The book will help chief operators understand their role in the FCC's new Emergency Alert System. It also provides details of the maintenance, monitoring and record-keeping requirements for all types of stations.

The book includes sample logs that can be used for recording station operating parameters. The cost of the book is $45 for NAB members and $75 for non-members. It can be ordered from NAB Services at (800) 368-5644.

Achievement Awards

WASHINGTON The NAB is accepting nominations for the 1997 Television and Radio Engineering Achievement Awards and the Service to Broadcast Engineering Award.

The awards are presented each year to individuals for outstanding contributions to the broadcast industry. The honorees will be recognized at the 51st NAB Broadcast Engineering Conference luncheon held during NAB '97 in April.

If you would like to nominate an engineer, contact Sandra Schultz at (202) 429-5346.

Second Annual Radio Festival

NEW YORK The Museum of Television & Radio planned to launch its second Annual Radio Festival on Oct. 28. During the 14-day event, the museum will present a series of seminars with producers, on-air personalities, programmers and hosts of top-rated radio programs.

Live radio broadcasts and a radio listening series will be featured along with an expanded "Recreating Radio Workshops" for families with children over 9 years old.

Radio Free Asia on the Air

WASHINGTON Radio Free Asia (RFA), established by the U.S. International Broadcasting Act of 1994, is officially on the air.

A private corporation, Radio Free Asia is funded by grants authorized by Congress to broadcast to China, Burma, Laos, Cambodia, Tibet, Vietnam and North Korea.

Its mission is to provide information, news and commentary about events in Asian countries and elsewhere and to be a forum for opinions and voices from within Asian nations.

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Digital Tools Dominate

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and orders, and provide on-line support.

Audio delivery, on the Web or otherwise, was news at WME.

POTS codecs and much more

DG Systems showed the Advantage Audio Communication Server, which allows radio stations to receive, record and send audio via standard or ISDN phone lines.

Digital Courier International showed Capella 3.0, an audio codec on a PC card that enhances applications of ISO/MPEG Layer II codecs.

Moseley Associates demonstrated STARLINK 9003 T1, a system for transmitting CD-quality audio over E1/T1 lines.

Station executives who want to feed digital remote audio without ISDN lines now have more choices. Comrex introduced its new HotLine codec for use with POTS (plain old telephone service) lines. Marti displayed its new Smarti codec. MUSICAM USA demonstrated its FieldFone and StudioFone. All are for use with POTS lines.

Attendees looking for digital mixers were able to visit the Fidelipac booth to learn about the new MX/D Digital on-air console, which offers a choice of analog or digital inputs, accepts both AES/EBU and SPDIF formats and will carry a typical price tag of about $11,000. It is expected to ship this fall.

On the analog side, Audioarts introduced its new R-5, an on-air console with "better than 16-bit digital audio performance" for a price of less than $6,000. It is targeted at small to medium markets and college stations.

The cart machines of the '90s are digital, too. Arrakis Systems Inc. featured its new Digilink 4 workstation, calling it a real, digital cart machine replacement. The hardware incorporates three players and a recorder, and fits in the space normally occupied by cart machines in a studio.

"At $3,495 it is less expensive than the four cart machines it replaces," Jon Young of Arrakis said. The system uses MPEG Layer II compression and stores a minimum of 12 hours of audio. Up to 48 studios can be tied together.

Broadcasters seeking automation and audio management systems found plenty of choices. Computer Concepts displayed Maestro, which integrates music, commercials and copy into station operations and provides for full automation. Pristine Systems showed Rapid Fire, an on-air digital broadcast playback system. Radio Computing Services introduced Master Control for Windows, featuring a digital air studio mode.

Other digital studio tools on display at the Radio Show included the new 360 Systems Shortcut stand-alone digital editing system, shown by BSW and Broadcasters General Store; ATI audio meters with digital inputs; and Virtual Session from Thompson Creative, which allows station managers to hear their jingles in CD quality as the jingles are recorded, without leaving the office.

RF engineers found plenty to interest them on the exhibit floor. Harris introduced a new 10 kW, solid-state FM transmitter, the Z10CD. Broadcast Electronics unveiled the Predator, a digital transmitter/exciter with power levels up to 250 W.

Shively focused on its full line of radio and TV antennas, combiners and other gear. Crown Broadcast presented its new FM receiver module for its transmitters.

Warner Electric/Superior Electric showed a new Stabiline UPS suitable for broadcast use. New products were on display at Andrew, Continental, ERI, JAMPRO and Nautel.

Digital DJ demonstrated a system that sends 1,000 words per second via FM subcarrier, to allow listeners to receive data while listening to the radio.

EAS and dereg

Broadcasters must move quickly to decide on an Emergency Alert System for their stations by the Jan. 1 deadline, as mandated by the FCC.

At least four EAS systems were on display, either in their own booths or those of distributors. They included products from Sage Alerting, TFT Inc., HollyAnne, and Burk. Dealers showing EAS products included Harris, Broadcasters General Store and BSW.

Jingle suppliers, program syndicators, database providers and format experts were well represented on the floor.

Many new tools help station managers deal with the realities of the changed broadcasting arena. Gentner Communications Corp. demonstrated its new GSC3000 transmitter remote control system. It can be networked and expanded, allowing great flexibility for operators of multiple stations.

Companies who make audio management systems are accustomed to thinking in terms of multiple facilities. Ron Paley of MediaTouch, which showed MediaDisk IV play-to-air software, said the company has in essence been configuring systems for "superduopolies" for several years.

Programming suppliers also see these trends in the business, according to Dave Newton, vice-president of marketing for Broadcast Programming.

He said the company offers consulting, formats and libraries in all categories of music. Although it has provided audio programming for years, he said, "more and more, we're becoming an expertise company.

"Topic A, of course, is consolidation and what impact that's going to have on all of our businesses. We're helping our customers learn how and what to program in these new station clusters in their markets. We have years of experience working with group owners, but now one group (may have) multiple stations in one city."

Newton said WME is "our main show. It has always been good to us."

Westwood Does the Talking

▶ continued from page 1

affiliates in Los Angeles and Kansas City, but Thom Ferro, executive vice president and general manager for Westwood One Entertainment, was confident that the live broadcasts will help Leykis re-establish his affiliate base.

"I think radio is something where there are constantly changing trends. There was a trend where stations went ultra-conservative, and he's not right-wing," said Ferro. "He ran a slogan on his show for a long time that said he wasn't a 'right-wing wacko or a convicted felon.' Now Limbaugh has peaked and slid down the other side a bit, so people are going, 'Wait a minute, maybe it's time to look at something else.'"

Ferro also pointed to Leykis as someone who has capitalized on the convergence of different technologies that are of interest to broadcasters.

"He's on line through his entire show, takes e-mails and faxes and responds to e-mails while he's on the air."

Liddy grabbed the spotlight at the show with his early morning broadcasts from the Convention Center lobby. Ferro said he believes Liddy's greatest appeal is his willingness to take any questions, on any subject.

Straight talk

"He gives you a straight answer," said Ferro. "If you want a question about Watergate, you'll get an honest answer."

Despite the setting, broadcasting issues were not on the talkers' agenda.

"We don't have the head of the FCC on," said Kahn. "We're there to put our programs on display and sell them."

The "Don & Mike" show also broadcasted its afternoon show at the Radio Show.

"It has a morning feel to it, in that it's personality driven," said Ferro. "There's no music. It's the best elements of morning shows in afternoon drive."

In on-air comments prior to the show, the duo sounded less than enthusiastic about attending NAB. Ferro dismissed the remarks. "That's their shtick," he said.

Sports for Generation X

Sports enthusiasts were able to catch Scott Ferrall's broadcast from the Biltmore Hotel lobby on Friday evening, as he growled out his views on the latest events from the sports world.

"Ferrall on the Bench" took to the airwaves just over one year ago, but Ferro is pleased with the program's growth.

"His show has tremendous major market penetration. He benefits from a couple of things. One, he's on at night, when radio stations don't have a lot of great programming. Second, his show is unlike anything you've ever heard."

Ferro said Westwood One is marketing Ferrall as a "Generation X sports program," citing the show's fast pace and use of heavy-metal music. "He's not your father's sports program," Ferro said.

Relationship issues were not overlooked during the live broadcasts. "Love Phones," which Ferro described as "sizzling talk about life, love and sex," offered a live program on Thursday evening.

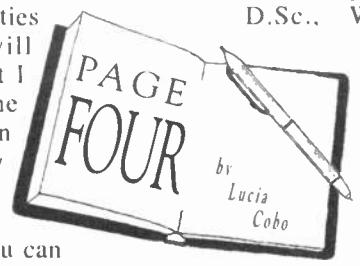
A roundup of the NAB Westwood One talk stable took place Friday night when all the talent gathered to meet and greet NAB attendees.

That event was a must see for anyone eager to see what happens when G. Gordon Liddy and Tom Leykis occupy the same territory.

Good News for IBOC AM and FM

LOS ANGELES For those of you who sat out World Media Expo and the 1996 NAB Radio Show, you missed a good time.

The exhibit hall was radio/audio-only (there was a video hall, too, but separate) and the quality of the traffic was "very good." Sessions were interesting and radio celebrities were everywhere. I will confess, however, that I was disappointed in the NAB Radio Luncheon keynote speech by Dolly Parton. She spent way too much time making body part jokes (and you can all imagine what parts I mean) and way too little time talking about the importance of radio, its relationship to the music business, or her own experiences as a radio station owner.



The country music industry was redeemed, however, by a riveting performance from Randy Travis at the NAB Marconi Awards dinner on Saturday.

The mood on the exhibit floor was very upbeat. Exhibitors were pleased with the amount of business they transacted in Los Angeles, and most were looking forward to a return to the radio-only fall gathering.

Arrakis Systems President Mike Palmer reported that this year's WME "is the best show we've ever had." He added that Arrakis has been having a "good year overall."

Going back to a radio-only crowd drew rave reviews from all exhibitors polled. Angelo Celidonio, news program syndication for USA Radio Network saw this last WME exhibit floor as "much more effective" than last year's combined one. Said Celidonio: "It allows us to focus on our customers and provide them with better service."

Thomcast Inc.'s John White reported a "nice show, but nothing spectacular." Said White of next year's NAB Radio Show: "We are radio people. We are looking forward to New Orleans."

All in all, it was a memorable, final World Media Expo.

★ ★ ★

The Society of Broadcast Engineers also held its annual conference concurrent with the NAB Radio Show. Of all the technical papers presented there, none was more interesting to me than the "Improved IBOC DAB Technology for AM and FM Broadcasting," by Brian W. Kroeger, D.Sc., Westinghouse Wireless Solutions Co., Linthicum, Md., and A.J. Vigil, Ph.D., P.E., USA Digital Radio, Linthicum, Md.

The paper is by far too technical to tackle in this column, but I'll give you a thumbnail sketch. (Look for a larger story on this in an upcoming issue of **RW**.)

First, the goals. As stated in the paper, the goals for U.S. digital radio are:

"The goal of FM DAB is to provide virtual CD-quality stereo audio and a 64 kbps ancillary data channel. The goal of AM DAB is to provide stereo audio with quality comparable to present analog FM quality and a 2.4 kbps ancillary data channel."

Earlier this year, about springtime, USADR commissioned the Deskin Research Group to study the IBOC DAB systems and to recommend modifications leading to a practical IBOC DAB. This group identified specific weaknesses in the FM IBOCs. According to Kroeger, the primary areas for needed improvement include:

- DAB interference to the host FM signal
- Interference to the DAB signal from the first adjacent FM signal
- Interference to the FM signal from the first adjacent DAB signal
- Interference between second adjacent DAB signals
- Robustness of the DAB signal in a multipath fading environment

OK. What do they propose to do about these? I'll again quote from the paper, and just from the conclusion — I'm leaving the technical explanation to Tom McGinley!

"Detailed analysis and simulation results support the viability and robustness of these improved (DAB) systems, of which demonstrations are anticipated in 1997.

"The FM IBOC DAB system will provide virtual-CD quality stereo audio using sidebands to provide frequency diversity and immunity to first adjacent interference. Time diversity is provided through interleaving. A blend-to-analog feature, with time diversity in the order of seconds, permits virtually instant tuning time while filling DAB audio gaps due to blockages or severe impairments. This feature will dramatically improve coverage in areas characterized by intermittent blockages.

"AM IBOC DAB will provide stereo audio quality similar to existing FM analog. AM IBOC DAB will exploit interleaving and blending-to-analog with time diversity features similar to FM IBOC DAB.

"AM and FM DAB will offer superior DAB coverage through an option to transition, at a future date, to reduced-quality analog simulcast or to digital only."

The conclusion goes on to state that the latter option allows an increase in power to the DAB signal with the addition of a supplemental DAB transmission consisting of a "lower rate compressed audio signal for time diversity reception and nearly instant tuning. This last feature is extremely effective against intermittent blockages and severe impairments, providing performance impossible to otherwise achieve with only frequency diversity, interleaving and FEC."

Westinghouse Wireless does indeed have a good track record in technology development and digital solutions. The silicon carbide transistor unveiled at NAB 1996 is one of the more recent WWSC products, a product designed for use in the world of digital television.

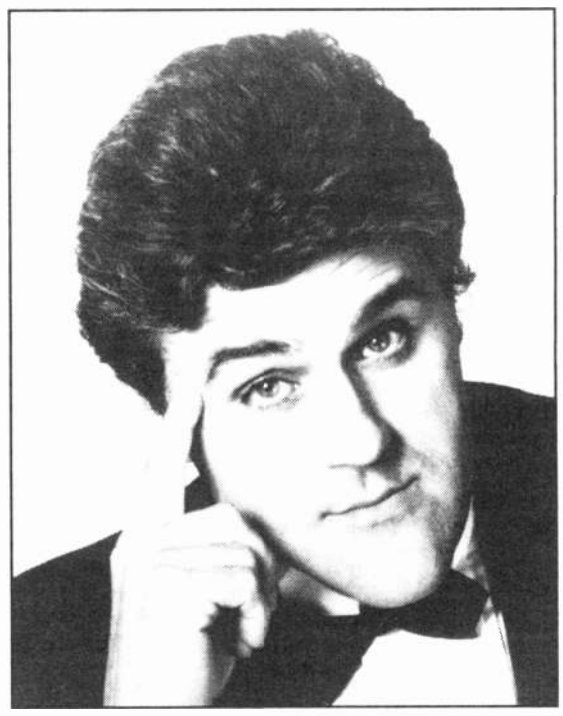
In addition, Westinghouse Electric Corp. Chairman and Chief Executive Officer Michael Jordan restated the company commitment to an IBOC solution for the United States.

Stated Jordan: "We look forward to working with the NAB to insure that U.S. broadcasters are provided with an opportunity to implement DAB in an efficient and cost effective manner."

★ ★ ★

One last note from Los Angeles. On Monday night, I was able to get my hands on tickets to see a taping of "The Tonight Show with Jay Leno." It was great. Tom Hanks was the featured guest along with Kareem Abdhul Jabar. The only reason I mention it is that I did not realize he records his show live to tape. He does not pause, edit or redo any part of the program.

It impressed me that one of television's late night stars could shine using one of the techniques pioneered by radio! (You knew I was going for the radio pat on the back, didn't you?) Very cool.



Jay Leno

READERS FORUM

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Crystal Radio Days On the Net

Surprisingly, many broadcasters are ignoring the Internet and the opportunities it presents for radio. They do so at their peril.

The explosive growth in the global computer network is the top technology story of the 1990s. Despite the hype (and it is considerable), radio managers must keep current with the possible uses — and potential threat — presented by the Net. It's more than just a home page that you update every few days; it's another medium that competes for your listeners and your advertising income.

To its credit, the NAB has done much to educate its members, through publications and convention seminars. But NAB President Eddie Fritts himself told us that "I have to think that the Internet quality has to go a quantum leap before it's really acceptable to the ... population" as an audio source.

As we report in "Running Radio" and as seen earlier this month on the exhibit floor at World Media Expo, suppliers are working hard to improve the delivery of high-quality audio. The new version of RealAudio from Progressive Networks and the introduction of streaming technology from Telos Systems are just two examples. Station managers and engineers must understand what these developments mean for live program feeds to listeners, and for non-realtime distribution of audio such as spots.

Sure, many Internet users visit websites via 14.4 modems and find it tedious. Yes, the Internet is balky at times. But consider how far it has come in one year. Think past 28.8 modems to ISDN and bigger, better pipelines. Consider the growing list of stations serving up live audio. Ponder the cybercasters that Alan Haber covers in his "Haberspace" column in **Radio World**. Think about all those creative people who can send interesting audio content to the world, without an FCC license.

Steve Church of Telos says Internet audio is still in its "crystal radio" phase. We think he's correct. If he is, the Internet may be the biggest threat to our business in many years. It could also be a gift.

—RW

GUEST COMMENTARY

Decades of Performing in 'The Theater of the Mind'

by Jim Davison

CLEVELAND In the Sept. 18 **RW**, Jerry Woods wrote about Seattle air personality Bob Liddle and his 50 years in radio. That article prompts me to write about another active radio legend.

I met a man about seven years ago at a radio meeting here in Cleveland. His name is Wayne Mack. He and I have become very good friends over those seven years, even though he is 50 years older than I am. Wayne began his radio career in October of 1931.

He visited a number of Cleveland giants seeking work, including WTAM(AM) and WHK(AM); all had big waiting lists of applicants. But on Huron Road, on the fourth floor above a little music store, he found WJAY(AM). Within five minutes of his arrival the program director had offered him a job.

He announced over WJAY until 1934, when he won a job with WGAR(AM). He worked there as production manager and announcer, with such greats as Sidney Adorn and Jack Paar. He interviewed stars including Amos 'n' Andy, Tommy Dorsey, Cary Grant and Benny Goodman.

Costs so much

During his tenure, WGAR changed frequency in 1944, from 1480 to 1220 kHz, and increased power in 1947, from 5 kW to 50 kW, joining the ranks of Cleveland radio giants. Wayne recalls a terrible gas explosion in the 1940s that leveled a number of blocks in the East 55th area. He and his sound crew were first on the scene, reporting the damage and the many deaths far into the night.

On the happier note, he often talks about the time he was doing a commercial at WGAR for Ohio Bell Telephone Company. He accidentally ended it with the line, "Ohio Bell: costs so much, and means so little."

These things happened when you were live.

Wayne recalls the time that television came into our homes as a sad time for radio. WGAR had a very large staff — a live orchestra, engineers and announcers. All lost their jobs due to this new thing called television. Hence came the DJ. There was no need for all these extra people; they were replaced by the disc jockey playing records. Live, produced programs became a thing of the past.

Wayne Mack (seated) with Author

Wayne's next step was to a brand-new station in 1950. Wayne, along with Fred Wolf and R. Morris Pierce, helped inaugurate WDOK(AM) at 1260 kHz. WDOK was located in the Cleveland Recording Company Building. Here you would find a staff of disc jockeys playing pop concerts and easy-listening music, along with a classical format. Wayne featured at least 35 hours of classical every week including an Intermission Quiz between concerts on Sunday afternoons and beautiful piano music every Friday night. He served as program director and was in charge of hiring. Also, it was at WDOK that Wayne started to create make-believe concerts from the studio. He called it "Home Town Park Band."

Like many radio people, Wayne paid his dues at several stations. After WDOK, he moved to Cleveland's ethnic station WZAK(FM), then to WCLV(FM), and on to WRMR(AM), the old WJW, at 850 AM.

While at WRMR, Wayne once again had his listeners fooled by a program he called "Palace Ballroom On The Lake." Here, Wayne would tell of this beautiful ballroom filled with people dancing, and you would hear the big band playing your favorite music. He would often interview movie stars and band leaders. Many people in the Cleveland area found themselves driving around on Friday nights trying to find this ballroom that seemed so real. Wayne had everyone totally fooled.

Still gracing the air

WCLV is where you will still find Wayne's deep, rich voice over the Cleveland airwaves. Each weekday at noon, Wayne has a show simply called "Noon With Wayne Mack." At WCLV, he plays classical music. This is one of the finest classical music stations in the nation. Wayne also writes all of his shows on a computer daily.

In his spare time, he still writes plays for "The Mighty Wurlitzer Radio Hour" specials, also on WCLV. Here, Wayne, organist Larry Kass and station manager Robert Conrad recreate radio the way it was in the early days of broadcasting when radio was live. They have an audience of 200 people, along with on-air lights; even the commercials are performed right before your eyes. After each commercial, the announcer waves his hand for applause. Then, Wayne reads his next line or two and Larry plays the historic 1928 pipe organ and the piano. It's well done.

Wayne Mack has been a part of Cleveland radio for more than 65 years, and at the age of 85 shows no sign of letting up soon. He has never been out of work. Wayne has truly outlasted them all here in Cleveland. We have been blessed to have such a great voice over our airwaves. Wayne told me something a long time ago that has never left my mind. He said it so simply: "Radio: It's a theater of the mind."

An Early WJAY Program

Radio World

Vol. 20, No. 22 October 30, 1996

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Radio World (ISSN: 0274-8541) is published bi-weekly by IMAS Publishing (USA), Inc. 5827 Columbia Pike, Suite 310, Falls Church, VA 22041. Phone: (703) 998-7600, Fax (703) 998-2966. Periodicals postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church VA 22041.
REPRINTS: Reprints of all articles in this issue are available. Call or write Giselle Hirtenfeld, PO Box 1214, Falls Church, VA 22041; (703) 998-7600, Fax (703) 998-2966.

—PRINTED IN THE USA—

Next Issue of Radio World
November 13, 1996

Hot Debate about Acoustic Foam

Companies Differ Over Relevance of Fire and Smoke Safety Ratings for Studio Foam

by D.C. Culbertson

FREDERICK, Md. There is a war of sorts going on regarding broadcast studios. It has nothing to do with things like ratings, equipment or the quality of announcers.

It has to do with what may seem like a relatively mundane matter: acoustic foam.

Rating effectiveness

More specifically, the problem centers around the best type of foam to use in studios, how it should be rated for effectiveness against fire and smoke and how flame-resistant it needs to be.

It does not help that the code ratings for effectiveness against fire and smoke are often confusing.

The three companies in the forefront of the present situation appear to be Systems Development Group in Maryland, illbruck in Minneapolis and RPG Diffusor Systems in Upper Marlboro, Md.

At present, most acoustic foams are polyurethane-based. Urethane has a number of characteristics that make it attractive to potential buyers: it is flexible and resilient, it cuts easily and it comes in a variety of colors. Unfortunately, it is also extremely flammable.

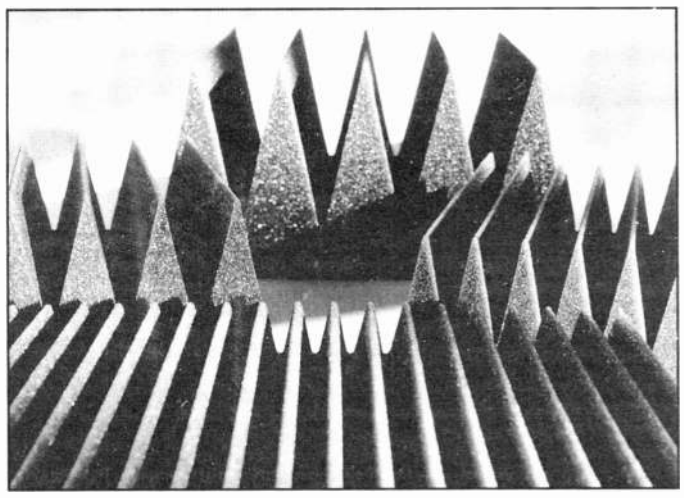
Generally, the National Fire Protection Agency (NFPA) regards acoustic foam in the category of Interior Finish — material used to change the aesthetic or acoustical properties of a room.

In order for any material in this category to be considered for inclusion in a building design, it must first be tested for effectiveness against both fire and smoke by the American Society for Testing and Materials (ASTM). The test used, "Test Method for Surface Burning Characteristics of Building Materials," is also used by the NFPA under the designation NFPA 255.

The test process

Eric Johnson of illbruck said he has observed the test, generally known as the Steiner Tunnel Test. It involves igniting material placed in a 24-foot tunnel marked in one-foot increments with a gas flame and timing the speed and intensity at which flames develop in a designated time period.

A Class A rating means the product will have a flame spread of no more than 25. A spread of 26–75 gets a B rating, and C-rated materials have a spread of 76–200. The standard for smoke, developed during the test, is identical for all classes (0–450).



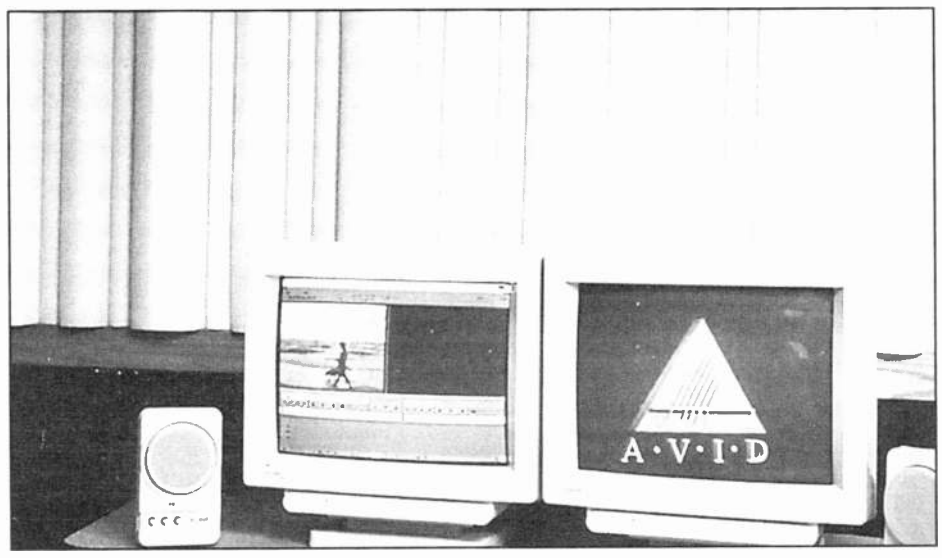
Acoustic Wedge from Systems Development Group

Flame spread refers to the speed at which flames spread within a designated time period. Materials must pass tests for both fire and smoke resistance or else they receive no rating at all.

According to Pamela Marchesano of RPG, OSHA does not like the use of polyurethane foam. She said its flammability has resulted in some "horrible" studio fires, but did not elaborate.

After learning about the fires, RPG decided that all of its acoustic foam would be built to guarantee an A rating for both fire and smoke.

As a result, about a year ago the company developed and began distributing Melaflex. Melaflex is made from open-cell melamine foam, a product originally developed at BASF in Germany.



SoundRound Melaflex from RPG Installed

Because of the high cost of melamine, RPG developed Variable Depth Air Cavity (VDAC) technology. The patent is pending on this technology, which is designed to use as little foam as possible while giving the same performance as a urethane-based product.

Melaflex is more brittle than urethane-based materials, cutting it can produce dust and its moisture content can vary according to ambient conditions. But RPG said that it is used in "over a thousand forefront music facilities around the world," including the studios at Sony Music and the Hit Factory and broadcast facilities at CBS, HBO and NBC.

According to an RPG bulletin, some foam manufacturers make claims and statements about the fire safety of their products based on irrelevant tests. These include citing "Class I" or "Class II" ratings, which only apply to tests on interior floor finishes; citing "One Hour" and "Two Hour" ratings, which only apply to certain wall structures or partitions; and citing Underwriters Laboratory (UL) tests, which refer to ceiling and electrical fixtures only.

Not true, said Eric Johnson of illbruck, whose company manufactures the SONEX line of foam, which Johnson said is sometimes called "the Kleenex of the industry" because it is used so much.

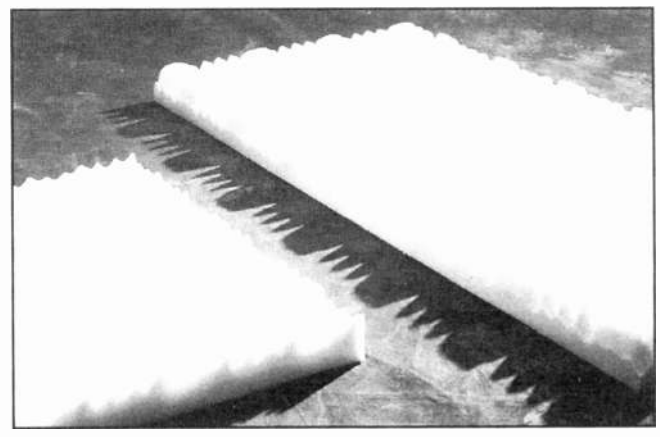
According to Johnson, the two agencies that issue building codes — UBC (Universal Building Code) and BOCA (Building Official Code Association) — issue identical fire tests but use different rating systems. One is based on letters and one is based on numbers.

In other words, a Class A rating on one test is identical to a Class I rating on the other. Johnson discounted RPG's report, saying that it is impossible for Melaflex to get different test results than SONEX Classic because they are essentially the same type of foam.

Johnson added that out of the three companies discussed in this article, illbruck is the only one that actually manufactures foam, while the other two companies are primarily distributors.

Recently, SONEX began manufacturing panels under the name SONEXclass and SONEXone. Both incorporate the German product willtech, an open-cell material that they say is flame-resistant.

Both the SONEXclassic and SONEXone panels are described as fulfilling "ASTM E 84 Class I requirements."



SONEXClassic from illbruck

Their polyurethane SONEXclassic panels are rated either Class II or have no rating at all, and the catalog includes a warning about their flammability saying that the materials should "only be used in sprinklered rooms meeting the applicable fire protection codes."

The SONEXprospec barrier cites UL ratings for flammability, which RPG described as irrelevant.

Disclaimer

As a sort of disclaimer, illbruck notes in its catalog that "The Federal Trade Commission considers that there are no existing testing methods on standards regarding flammability that are accurate indicators of the performance of cellular plastic material under actual fire conditions.

"Any result of existing test methods ... are intended only as measurement of performance of such materials under specific controlled test conditions."

The tests they cite as examples of this include ASTM E 84, ASTM D 1692 and UL 94.

Bernie Chlop, president of Systems Development Group, shared similar thoughts. Although his company's product, Cutting Wedge, is polyurethane-based, it does have flame retardant poured into its grooves.

The resulting product is still not Class A rated because it did not pass tests for both fire and smoke.

Chlop feels the current rating system is unreasonable and cited as problems the fact that tests for fire and smoke differ widely depending on who is doing the testing. He added that building codes also differ widely not just from state to state, but county to county.

"It's driving us crazy," he said.

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

Listeners and programmers agree.

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

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Waiting for the Promised (AM) Band

▶ continued from page 1

the allotment software. By early October, the staff had finished the new allotment plan which — with a draft Reconsideration Order — will be considered by the full commission.

Two stations already have temporary authority to operate in the expanded band: WJDM(AM), Elizabeth, N.J. on 1660 kHz and KXBT(AM), Vallejo, Calif., on 1630 kHz. Both are guaranteed a spot on the expanded band although the frequency could change.

Meanwhile, the other 85 AM stations on the March list will have to wait to see if they make the next list. RW talked to six of those stations. Surprisingly, a couple were not very enthused about moving to the new band which will offer them a 10 kW signal during the day and a 1 kW signal at night.

WNTM(AM), Mobile, Ala. formerly WKRG(AM), was on both the Oct. 1994 list and the March list. But General Manager Tim Camp said "We have turned that back into the commission."

When Capital Broadcasting bought WNTM in the Fall of 1994, it was 1000 W Days and 500 W nights. The company requested and received a power increase for 1000 W around the clock.

Since the area is right on the Gulf of Mexico, Camp said the upper end of the band is pretty much useless at night with all the signals coming in from South America.

"I realized you get 10,000 W day. We have 1000 W daytime at 710 kHz. At 710, it just really covers well during the daytime," said Camp.

Lower power

WCMQ(AM), Miami Springs, Fla. was selected to move from 1210 kHz to 1700 kHz. Ralph Chambers is chief engineer at the station which is owned by Spanish Broadcasting Systems. WCMQ(AM) currently operates at 25,000 W daytime and 2,500 W nighttime.

"I'm not excited about it because I'd have to lower my power," Chambers said of the move. Chambers said that the station has an opportunity to increase its power to 32,000 W day and 3,500 W nights at its current position.

He added that the new POWER-side that the station installed from Kahn Communications Inc. had made a noticeable improvement in their signal.

"We're grateful for the effort that's being put forward which will help other stations," said Chambers. "I think there is going to be some improvement."

At KRGI(AM), Grand Island, Neb., general partner and owner John Kidd said they have not made a decision whether or not to move.

Kidd said a lot has changed in the three and a half years since the expanded band idea was announced. The small-market station is trying to decide if the cost to move, which Kidd estimated to be over $100,000, would be worth it in the end.

"It's well worth it," said Steve Bridges, general manager and majority owner of KCJJ(AM), Iowa City, Iowa. He said he was told that at 1630 kHz, his station will reach 20 states.

"It's whether you believe in AM radio," said Bridges. "I believe AM radio is radio and if you put something unique out there, people will listen."

At present, KCJJ is a 1,000 W station at 1560 kHz. Bridges called it a progressive station pointing to the four-person news staff, AC format in stereo and heavy involvement in the community of 100,000.

Once the station migrates, he said he plans to keep the news commitment and may tweak the format to include some Jazz or Blues tracks.

"The day we get our permission is the day we start the ball moving," said Bridges adding it will probably take four to six months to get on the air.

He said if the commission will allow it, he would like to keep the old position even at reduced power.

Doyle said all stations will have a five year window during which they will have two stations. He said the commission will decide at that point whether the owner will have to turn in the old frequency.

KSOS(AM), Brigham City, Utah is eligible on the March list to move from 800 kHz to 1670 kHz. The oldies station currently broadcasts at 1000 W in the day and 32 W at night.

Program Director Brent Larson said the station is anxious to get going.

"It'll be a vast improvement for us," he said. "I'm just surprised that this second go-round is taking so long."

Larson suggested that the stations who are not planning to move to the expanded band may not believe it is going to happen.

"Once the thing starts going and they have the authority to do it, I think they'll see the advantage," he said.

In College Station, Texas, WTAW(AM) will be eligible to move from 1150 kHz to 1620 kHz once the FCC resolves the petitions for reconsideration.

"We're anxiously awaiting it," said Chief Engineer Mark Steptoe. "We're just waiting for things to happen."

Steptoe said he would not be surprised if the new station were up and running within three to six months of the go ahead.

"These guys are that ready."

INTERNATIONAL UPDATE

WorldSpace Conducts Its First Tests

by T. Carter Ross

ERLANGEN, Germany The goal of bringing satellite-based digital audio adcasts to people in developing ions recently took one step closer ward reality.

The Fraunhofer Institute in Erlangen, rmany, successfully conducted the st series of tests of the WorldSpace AB system at the end of September.

Using a prototype receiver built by the titute for the tests, Fraunhofer engi- rs transmitted digital audio signals m a helicopter.

eception was tested in a variety of situ- ons and locations to ensure that the rldSpace system can realize its mise of delivering high-quality digital lio and ancillary-data services to listen- in developing nations throughout rica, Asia, the Caribbean and Latin nerica.

The WorldSpace plan calls for the velopment of low-cost, multimedia eivers that will be able to receive pro- mming directly from a satellite. The s demonstrated that signals could be eived by listeners walking along a dside, driving in a car or sitting in ir homes.

"This demonstration proves that the WorldSpace system will work for people on the move," stated WorldSpace President and CEO Noah Samara in a press release.

According to Eugene Reich of WorldSpace, the next step for the company and for the Fraunhofer Institute is to expand on the first series of tests to get a better idea of the characteristics of the transmission system.

Using a helicopter equipped with a special digital transmitter, the engineers tested a variety of characteristics of the system, including the effect of elevation levels and angles on reception.

Mobile, stationary and portable reception tests were conducted with favorable results.

In addition to conducting developmental and implemental tests of the system, the Fraunhofer Institute has developed a customized version of the ISO/MPEG Layer III algorithm for WorldSpace. This algorithm will make it possible for the WorldSpace satellites to broadcast good quality audio at transmission rates as low as 16 kbps.

Commercial versions of the WorldSpace receivers, which will be called StarMan receivers, will be ready by mid-1998. Mid-1998 is also the scheduled launch date for AfriStar, the first of the three WorldSpace satellites.

The AsiaStar and CaribStar satellites will be launched in late-1998 and mid-1999 respectively.

WorldSpace Prototype Receiver

INTERNATIONAL UPDATE

IBC Proves Naysayers Wrong

by Marguerite Clark

AMSTERDAM, Netherlands In the past few years, some uncertainty has arisen regarding the strength of the International Broadcasting Convention (IBC) because of the decision to hold the show annually.

But now that the 1996 show has come and gone, there is no question that IBC is holding strong and will remain an important venue for the audio and video industries.

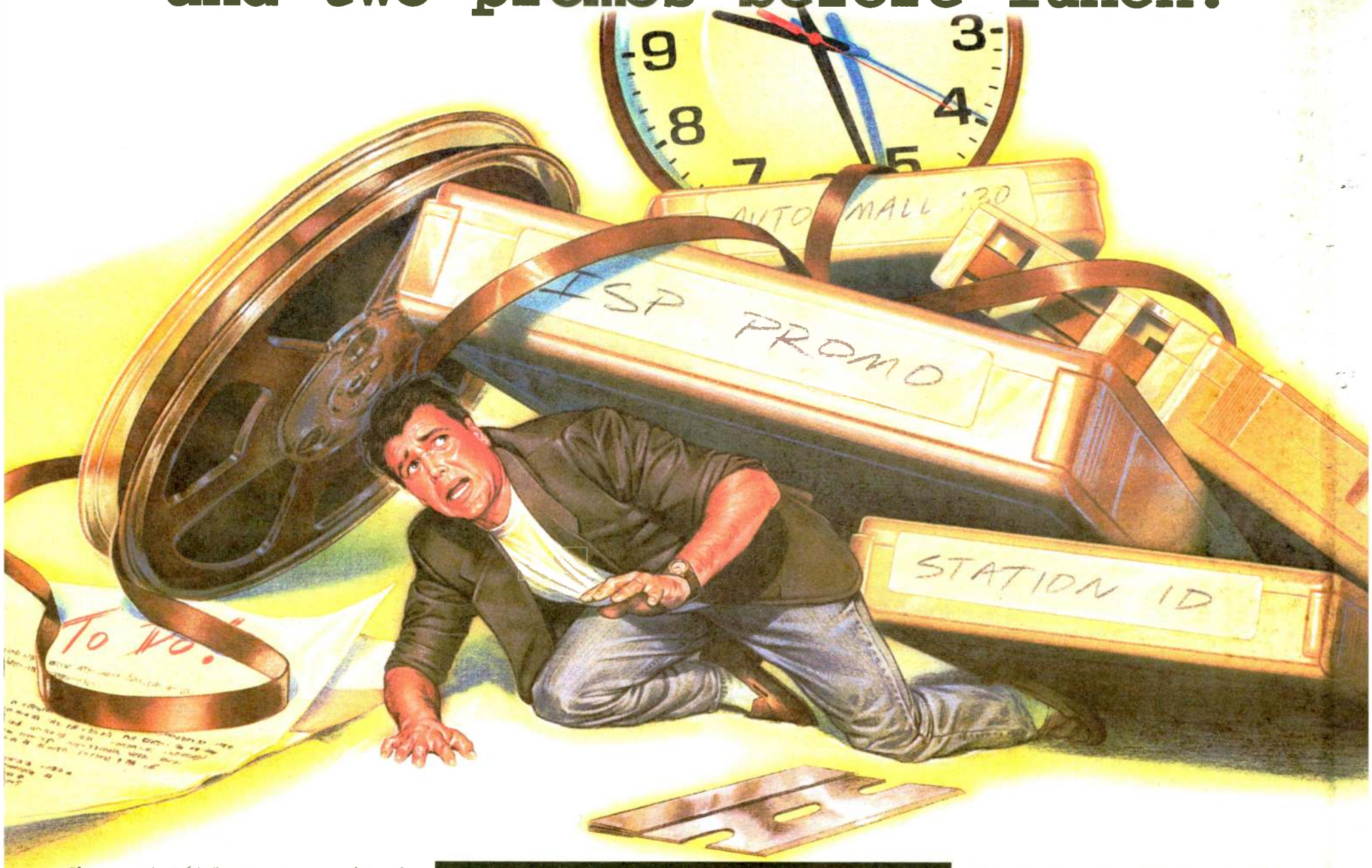
According to organizers, approximately 30,300 people from 124 countries attended IBC '96, held Sept. 12-16 at the RAI Convention Center here in Amsterdam. Attendance was up from 25,000 people in 1994 and 20,000 in 1992.

Approximately 484 stands, occupied by 650 exhibitors, were spread across 27,500 square meters of floor space. Moreover, four additional halls were utilized for this year's show.

Those participating in IBC '96 were satisfied by the turnout; however, some believe the show could be shortened to three or four days.

By the final day of the show, more than 200 companies had already reserved stands for IBC '97, which promises to be an interesting year, considering that the International Television Symposium in Montreux, Switzerland, will take place June 12–17, just three months prior to IBC.

It's 9:30 am. You've got to edit nine phone-ins, cut a dozen spots, record four station I.D.s and two promos before lunch.



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MUSICAM USA®

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Models 110, 120, 210, 220 & 230

Intelligent codecs for remote digital audio – with the world's best sound

CDQPrima

- Full Duplex Bi-Directional 20 kHz Stereo
- Best Digital Audio Quality for Broadcast, Pro Audio, Recording and Voice-Over
- ISDN, Satellite, T1, E1 and Dedicated Lines
- **CCS MUSICAM®** World-Standard ISO/MPEG Layer II
- ISO/MPEG Layer III and G.722
- SMPTE Timecode
- Multiple Ancillary Data Streams
- Built-In Automatic Smart Features
- Up to 384 kb/s Contribution Quality

More Connectivity For The Most Compatibility

CDQPrima®, the first intelligent multi-algorithm platform for remote digital audio, offers the highest quality with the most connectivity for maximum compatibility with CCS MUSICAM®, Layer II, Layer III and G.722.

The digital audio codec that provides the best audio quality and the widest range of features also has the most connectivity. MUSICAM USA's **CDQPrima** series codecs not only offer **CCS MUSICAM,** the enhanced ISO/MPEG IRT-certified Layer II, but also feature ISO/MPEG Layer III, as well as G.722.

CDQPrima Sounds Better

When quality audio is your most important product, you need a CDQPrima. We've designed every CDQPrima model to give you the best possible audio performance:

- Dynamic range of better than 92 dB
- Ultra-low distortion of less than 0.01%
- AES/EBU digital inputs and outputs (an option on Model 110)
- 20 bit A/D converters
- Gold plated Neutrik® connectors for long lasting system performance
- Sophisticated audio metering and headphone monitoring circuits
- Full contribution quality at bit rates up to 384 kb/s

Exclusive CCS MUSICAM For the Best Sounding Layer II

CCS MUSICAM is praised as a world standard for its pristine sound. CCS MUSICAM is our enhanced version of ISO/MPEG Layer II encoding. It has been certified by the IRT[1] as fully compatible with all ISO/MPEG Layer II decoders. CDQPrima encoding improves the sound of any Layer II decoder.

- Standard of the world's largest broadcasting networks and satellite systems
- All MPEG modes and options plus CCS' enhanced coding algorithms
- Worldwide compatibility with more than 12,000 CCS MUSICAM audio codecs installed, and compatibility with most other codec brands
- Exclusive MUSICAM USA enhancements to Layer II encoding yield audible improvements

The Best Sounding Layer III

The efficiency of Layer III's low bit rates combine with the exquisite design of CDQPrima for the best sounding ISO/MPEG Layer III and maximum compatibility.

- Best digital audio at the lowest bit rates available
- FhG[2] certified Layer III guarantees compatibility with other Layer III codecs
- Full independent stereo at bit rates up to 320 kb/s – Layer III's maximum bit rate
- Layer III provides 15 kHz mono audio on a single ISDN "B" channel (64 kb/s)

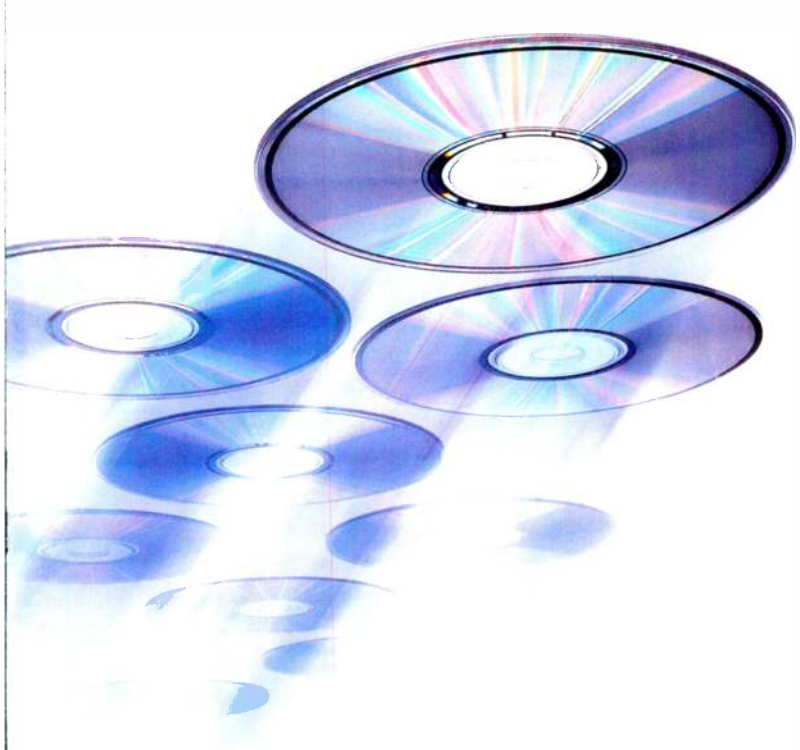
1 Institute für Rundfunktechnik
2 Fraunhofer Gesellschaft

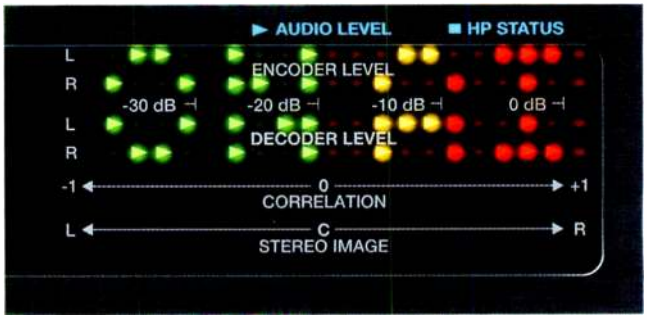
CDQPrima Does More

Easy To Use Built-In, Automatic Features

Broadcast and audio professionals have come to expect superior quality and the most advanced features from CDQPrima. Simple to set-up and operate, CDQPrima comes with automatic factory presets and Quick Configurations built in. On-board intelligent systems automatically recognize the calling codec, set appropriate bit rates and operating modes – even operate remote equipment at the far end connection.

- Programmable for "one touch" automatic dialing and instant networks
- Download software upgrades from the factory over ISDN
- Dial on audio/hang up on silence for hands-free connections
- Automatic STL (Studio-to-Transmitter Link) backup and restore
- Instantly reconfigures bit rates, stereo mode and algorithm – automatically





A World Of Connectivity At Your Fingertips

CDQPrima anticipates your requirements for all types of remote audio applications. Built-in intelligence matches bit rates, stereo or mono audio and all parameters. CDQPrima is versatile enough to be your primary STL or your STL back-up, connect automatically for same-time-every-day feeds, close relays to start a tape deck at the far end or interface with any satellite system.

- Two stereo audio channels, SMPTE timecode, two RS232 ancillary data streams, RS485, up to eight opto-isolated inputs and eight dry floating relay outputs, scrolling text messages and command and control for the far end unit – all on one ISDN line
- CDQPrima is ideal for ISDN with 256 full-configuration speed dial memory locations, each with six ISDN "B" Channel numbers
- CDQPrima's optional intelligent on-board ISDN Terminal Adapter stores ten sets of ID and SPID numbers for easy portability
- Broadcast to up to three stereo locations or six mono with no additional hardware
- "Dual Channel Send" lets you send two separate mono programs to two separate locations – simultaneously
- ISDN Terminal Adapter supports various D-channel protocolls for worldwide usage
- CDQPrima features J.52 for multiline ISDN IMUX (BONDING)
- Optional X.21 and V.35 Digital Interface Modules interface easily with dedicated data lines, satellite, T1 and E1
- CDQPrima is the perfect choice for radio, TV, audio and video post production
- CDQPrima does everything from superb voice-overs to full fidelity digital mastering

There Is a CDQPrima Model To Fit Every Need

There are five CDQPrima models, varying from the economy single slot Model 110 to the deluxe, three slot Model 230. All models give you the same unsurpassed audio quality and basic functionality. All are bi-directional stereo, and all contain a 256-address ISDN speed dial memory system.

CDQ 110

Economy, ideal for unattended operation, full time dedicated STL, STL backup, satellite receive site, etc. 1x interface module slot for ISDN, X.21/ RS422 or V.35 digital interfaces.

CDQ 120

Ideal for attended operations and studio remotes connected to one ISDN line. Includes VU meters, status LEDs, AES/EBU I/O, headphone and front panel R/C jacks – one interface module slot.

CDQ 210

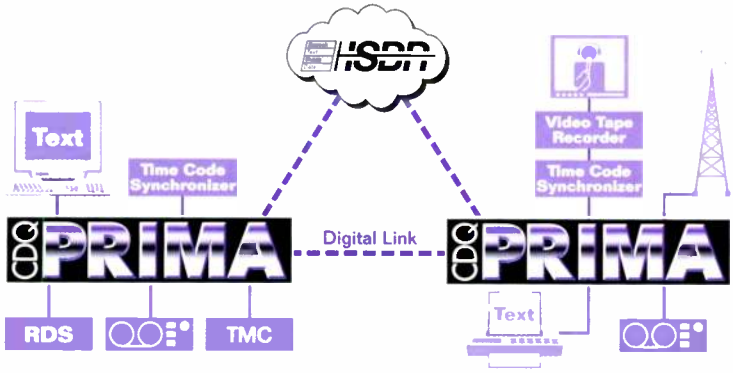
Economy, ideal for unattended operation. Includes XLR AES/EBU and RS485 port – three interface module slots for up to three ISDN lines (six ISDN "B" channels) or mixed digital interface modules.

CDQ 220

Ideal for attended operations and studio remotes with connection to up to three ISDN lines. Includes VU meters, status LEDs, AES/EBU I/O, headphone and front panel R/C jacks, RS485 port - 3x interface module slots.

CDQ 230

Our deluxe model, for studio head end use and critical monitoring locations. Includes all features listed above, plus graphics LCD, spectrum analyzer, X-Y phase display, extended keypad with assignable hot keys and enhanced status display – 3x interface module slots.



- **Satellite backup**
- **Point-to-multipoint**
- **Reporting, Voice-over**
- **SMPTE time code**
- **News distribution**
- **Program exchange**
- **Cart machine control**
- **DAT recorder control**
- **Network control**
- **Advertisement distribution**
- **Studio-to-transmitter link**
- **RDS, TMC, text data insertion**
- **Flexible multiplexer**
- **Telephone subsystem integration**

Features To Fit Your Needs

CDQPrima Model	110	120	210	220	230
Mechanical Features					
Dimensions: 19 inch (48.3 cm) Rack Mount	1U high	1U high	2U high	2U high	2U high
Digital Interface Module slots	1	1	3	3	3
World Power Supply, rear power switch	X	X	X	X	X
Dial and control keypad with audible beep	X	X	X	X	X
Backlit LCD display with variable contrast	character	character	character	character	graphic
Digital LED average & peak VU meters		X		X	X
L/R correlation & stereo image display		X		X	X
Scrolling text messages on VU meters		X		X	X
Intelligent headphone monitor system		X		X	X
Additional front panel remote control port		X		X	X
Audio I/O, SMPTE & Ancillary Data					
20-bit A/D converters	X	X	X	X	X
Gold plated Neutrik® XLR audio connectors	X	X	X	X	X
AES/EBU digital input, output and synch	● DB9	DB9	XLR	XLR	XLR
Automatic rate adaptation	X	X	X	X	X
Optical Digital I/O			●	●	●
Spectrum analyzer & phase display					X
SMPTE Timecode			●	●	●
Asynchronous ancillary data RS232	X	X	X	X	X
Additional asynchr. ancillary data RS232			●	●	●
Synchronous ancillary data	●	●	●	●	●
Compression Algorithms					
ISO/MPEG Layer II (CCS MUSICAM® encoding)	X	X	X	X	X
ISO/MPEG Layer III	X	X	X	X	X
CCITT G.722	X	X	X	X	X
16, 24, 32 & 48 kHz sampling rates	X	X	X	X	X
Additional algorithm capacity	X	X	X	X	X
Command and Control					
68020 Integrated Support Processor	X	X	X	X	X
Software update via RS232 & inband ISDN	X	X	X	X	X
J.52 IMUX (BONDING)	X	X	X	X	X
H.221 transport protocol	X	X	X	X	X
Extensive on-line help	X	X	X	X	X
Headphone select and level control keypad		X		X	X
4-button cue keypad		X		X	X
Hot keys & extended feature keypad					X
Full remote control via RS232 & RS485	X	X	X	X	X
Front panel RS232 remote control port		X		X	X
Optically isolated remote control inputs	● 4	● 4	● 4 or 8	●4 or 8	●4 or 8
Dry floating relay contacts or TTL outputs	● 4	● 4	● 4 or 8	●4 or 8	●4 or 8
Virtual control lines connecting each unit	12	12	12	12	12
RS232 control port, no modem control	X	X			
RS232 control port, full modem control			X	X	X
RS485 control port			X	X	X
Programmable summary alarm relay	X	X	X	X	X
Programmable silence detector	X	X	X	X	X
Programmable peak level detector	X	X	X	X	X
Bit error rate detector	X	X	X	X	X
Out-of-frame detector	X	X	X	X	X
Additional Options Available					
ISDN, X.21/RS422, and V.35 DIF modules	●1	●1	●3	●3	●3
Windows® remote control software	●	●	●	●	●
Psychoacoustic parameter adjustment	●	●	●	●	●

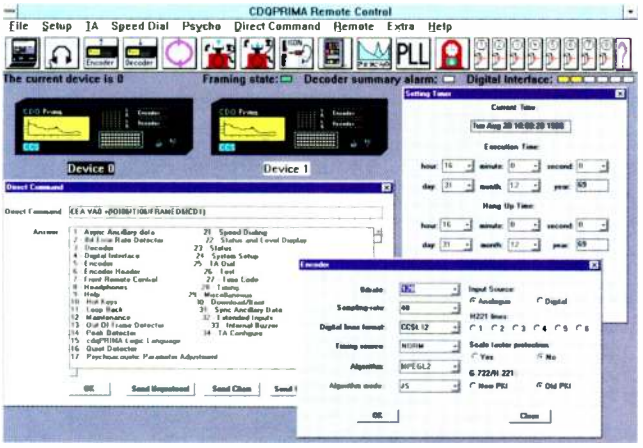
X = always present
● = hardware/software option (for example, ●3 means optional 3)

Specifications are subject to change without notice

Engineered for Today's Digital Audio – But Future-Safe, Too

Windows® Remote Control Option for CDQPrima

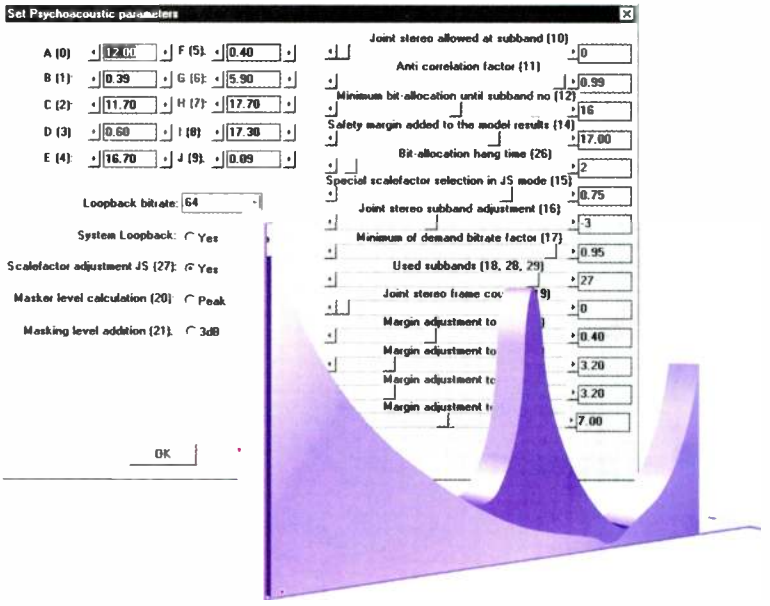
Our optional Windows Remote Control Program gives you keyboard control of every CDQPrima function, and a wide variety of additional features. You can finetune MUSICAM's psychoacoustic parameters, construct advanced automatic functions, schedule automatic connections on a time-of-day basis, and even control up to 30 CDQPrima units remotely – all from a single PC. Our Windows Remote Control software runs on your Windows® or Windows 95® PC, and features easy to read graphics, screens and icons.



Customize the CCS MUSICAM algorithm with Psychoacoustic Parameter Adjustment

Based on a psychoacoustic model of the human ear and advanced techniques, CCS MUSICAM removes audio data judged irrelevant. Now, CDQPrima gives you the ability to tune the psychoacoustic model to meet your own needs, yet still be compatible with ISO/MPEG Layer II decoders. You can access up to 240 psychoacoustic parameter tables, adjust and set them to customize your audio, and even store parameters for recall.

More than a decade of our own experience in optimizing the Layer II algorithm is packed into every CDQPrima. Nevertheless, we want to let you play a part in the improvement of coded audio. Trust your own ears to create the sound you need.



CDQPrima Logic Language PLL

Access advanced codec features with over 180 commands

CDQPrima is the first and only codec with intelligence, as well as superb audio. Every Prima lets you define, store and recall Event-to-Action Logic using easy-to-understand Prima Logic Language. Only CDQPrima lets you switch between near-end and far-end codecs to access and view "Virtual Actions". PLL gives CDQPrima the power to control and be controlled by other devices on your network.

SMPTE Timecode – On A Single ISDN Line

CDQPrima codecs equipped with optional SMPTE I/O boards accept standard SMPTE timecode signals and transmit them perfectly synchronized along with the audio to produce standard SMPTE timecode at the far end unit. Ideal for audio and video post-production, CDQPrima can synchronize recorders and other equipment over ISDN, satellite or dedicated data lines. For ISDN, Prima requires only 128 kb/s – two ISDN "B" channels, or one ISDN BRI – for crystal clear digital audio, SMPTE timecode, ancillary data, eight contact closures, scrolling message displays and full far-end remote control.

Ready For Tomorrow – Today

Hardware modularity and alterable software allows the CDQPrima to adapt to the future. CDQPrima uses easily changeable Digital Interface Modules and downloadable operating software to give you room to grow. Your CDQPrima can be easily upgraded to meet tomorrow's needs as new algorithms and digital transmission services become available. New operating software can be downloaded to your CDQPrima directly from the factory.

CDQPrima Technical Specifications

Analog Audio Specifications

Connector type	Gold plated Neutrik® 3-pin XLR Input: female Output: male
A/D converter	20 bits sigma-delta
Sample frequencies	16, 24, 32, or 48 kHz
Input impedance	600 ohms or >25 kohms, balanced
Output impedance	600 ohms or <60 ohms, balan.
Clipping level	18 dBu
Insertion gain	0 dB (0.5 dB
System frequency response	±0.3 dB, ref. 1 kHz
Fs=16 kHz	20 to 7,500 Hz
Fs=24 kHz	20 to 11,250 Hz
System frequency response	±0.15 dB, ref. 1 kHz
Fs=32 kHz	20 to 14,500 Hz
Fs=48 kHz	20 to 20,000 Hz
Total harmonic distortion	<-80 dB at 1 kHz
Signal-to-noise ratio	>92 dB
Crosstalk	<-85 dB
L/R phase difference	<0.5°
Compression algorithms	CCS MUSICAM® Old CCS MUSICAM® New ISO/MPEG Layer II ISO/MPEG Layer III CCITT G.722

Digital Audio Specifications

Digital audio connectors Models 110 & 120	DB9, female (optional XLR adapter available)
Digital audio connectors M. 210, 220 & 230	Audio input: gold plated Neutrik® 3-pin XLR female Audio output: gold plated Neutrik® 3-pin XLR male Sync input: gold plated Neutrik® 3-pin XLR female
Type of interface	AES/EBU
Lock range	±200 ppm
Rate adaptation	Automatic

Data Interface Specifications

Network Interface

Types		ISDN BRI (2B+D) RS422 V.35 X.21
Number of B channels		From 1 to 6 in parallel
Bit rates		24, 32, 40, 48, 56, 64, 80, 96, 112, 128, 144, 160, 192, 224, 256, 320 or 384 kbit/s

Ancilliary data channel

Type of connector		DB9, female
Bit rate	Direct	300, 1200, 2400, 4800, 9600 or 38,400 bit/s
	Mux	300, 1200, 2400, 4800, 9600 or 19,200 bit/s
Mode		8 data bits, no parity, 1 stop bit
Handshake		None required

Alarm Interface

Type of connector	DB9, male
Functions	Summary Alarm
Type	Form C contacts

Control Interfaces

Level Meters	Mode	Average with peak hold
	Range	0 to -40 dB relative to full scale
	Mode	L/R correlation
	Range	+1 to -1
	Mode	Stereo image
	Range	+90 to -90 degrees
Scrolling text display		
Selective variable intensity		
Headphone Output	Modes	Encoder or Decoder monitor L Encoder to both ears R Encoder to both ears L Decoder to both ears R Decoder to both ears
	Level control	Via front panel or remote control Separate level set for encoder and decoder
Remote Control (Rear and front panel)		
	Features controlled	All
	Electrical interface	RS232-C or RS485
	Connector	DB9, male (rear), 1/8 inch (0.32 cm) stereo jack (front)
	Bit rates	1200, 2400, 4800, 9600 or 38,400 bit/s
	Mode	8 data bits, no parity, 1 stop bit
	Handshake	None, or XON/XOFF
Digital Control Outputs	Type	Dry floating relay or open collector TTL
	Number	4 or 8 (only M. 210, 220 & 230)
	Connector	DB25, female
Digital Monitor Inputs	Type	TTL or optically isolated
	Number	4 or 8 (only M. 210, 220 & 230)
	Connector	DB25, female
Cue Channel:	Input	Front panel push button (Models 120, 220 & 230 only)
	Output	Front panel LED (Models 120, 220 & 230 only)
SMPTE Time Code (Models 210, 220 & 230 only)		
	Type	Both input and output
	LCD display	Hours, minutes, seconds, frames, mode
	Mode	24, 25, 30 & drop frame automatically detected
	Connector	DB25, female (optional XLR adapter available)

General

Environmental Conditions

Storage temperature	-40 to 70(C (-40 to 158(F)
Operating temperature	5 to 45(C (41 to 113(F)
Relative humidity	20 to 80%, non-condensing
EMC	EN 50081-1, EN 50082-2
Power Line voltage	90 to 250 V AC, 47 to 65 Hz

Dimensions and Weight

Height	Models 110 & 120 1U (1.75", 4.45 cm) Models 210, 220 & 230 2U (3.5", 8.89 cm)
Width	19" (48.26 cm)
Depth	12.2" (30.99 cm)
Net weight	Approx. 10 lbs. (4.5 kg)
Shipping weight	Approx 19.6 lbs. (8.9 kg)
Certifications	CE Mark, ISO-9000 manufactured

CDQPrima 120
rear panel – one digital interface slot, AES/EBU digital audio I/O standard

CDQPrima 230
rear panel – three digital interface slots, note SMPTE timecode and additional data ports.

Specifications are subject to change without notice

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Fax On Demand: 908-935-2777
Internet: http://www.musicamusa.com
Email: cdqprima@musicamusa.com

Telos, Apple Introduce Audioactive

by Frank Beacham

CLEVELAND Telos Systems, the veteran manufacturer of digital audio products for radio broadcasters, has announced alliances with Apple Computer and Macromedia as it enters the highly competitive field of webcasting over the Internet.

Telos, now completing testing of its new Audioactive audio streaming technology, said Apple has begun using the new format for all Apple webcasts, including live music performances.

"The Apple relationship has two parts," said Neil Glassman, marketing director at Telos. "They are our first significant customer. They have purchased and are using our hardware encoders on their web site (http://live.apple.com). Second, they are a technology partner to work with us on multicasting technologies."

Compatibility

Telos also announced that Audioactive is fully compatible with Macromedia's Shockwave multimedia software. The more than 6 million existing Internet web browsers equipped with Shockwave plug-ins can automatically receive and play streamed audio in the Telos format, the company said.

For audio that is not streamed live, Macromedia's multimedia authoring product, Director, can provide the editing, processing and compression necessary for creating Audioactive files. "We expect some announcements in the coming weeks about how Telos hardware and Macromedia's software can be used together by web site developers," said Glassman.

The Telos webcasting technology is based on MPEG-2, Layer III bitrate reduction, the same processing scheme the company uses in its Zephyr codec for ISDN remote broadcasting. Rather than encode audio on a general-purpose personal computer, Telos will offer Netcoder, a dedicated hardware-based encoder that uses a five-chip DSP compression engine that it designed in cooperation with Germany's Fraunhofer Laboratory, the inventor of MPEG Layer III technology.

"We have an advantage because we are working with an MPEG standard that is not a closed, proprietary system," said Glassman. "It's open for a lot of people to license. Different types of players for different purposes can all tap into the MPEG stream.

"In addition, for the encoding of live streaming audio we've got a 'plug and play' box in a form that's familiar to broadcasters," Glassman continued. "You plug in your audio through XLR connectors and hook it to your server via TCP/IC. As Telos did with ISDN, we are trying to make the process easy for broadcasters."

Three from Apple

Apple is currently offering three different quality versions of its live Internet program feeds: one for 28.8 modem users that's described as "better than AM quality;" for 56K (single-channel ISDN) users that's "near FM quality;" and for 96K (two-channel ISDN) at "near-CD quality."

Users of Power Macintosh and Pentium PCs can download a free Audioactive player that can be installed as a helper application with web browsers. (To hear samples and download the player, go to http://live.apple.com or http://www.audioactive.com).

With the assistance of Glassman, Radio World downloaded and installed the Power Macintosh player as a helper application for Netscape Navigator 3.0. Though the sonic quality over a 28.8 modem connection was adequate on a variety of sampled material, all the clips were plagued with frequent drop-outs. Such drop-outs occur because Internet routers are allowed to drop packets that can cause long delays when the receiver sends a request for the lost data and then has to wait for it to be re-sent.

The drop-out problem, Glassman said, is more prevalent on the Macintosh player (in alpha testing at the time of the demo) than the more advanced Windows version player, then in beta testing. "The technology to get rid of that drop-out is coming," Glassman assured. RW also downloaded the Windows version, without experiencing dropout problems.

The key components of the Audioactive system are the Netcoder; the server, which duplicates the input bitstream to serve multiple simultaneous listeners; and the player. The Netcoder, slated to cost under $7,000 including site license, is adjustable but can support only a single bitrate at a given time. Multiple encoders can be used to serve streams to Internet listeners at different rates.

Telos said it also plans to take advantage of the IP Multicast standard in Audioactive which will also be supported by Apple's new Quicktime TV application software. Quicktime TV sends live audio and video over networks such as the Internet. The IP Multicast standard is expected to improve the network performance of Audioactive and extend the reach of people who can access webcasts.

The Telos server component will also be offered on Apple's Network Server 700 running under AIX, the company said. Users interested in serving Audioactive streams can combine the Telos Netcoder device with the Network Server 700 system for a complete Internet broadcasting system.

Campaign '96: A Look at the Issues

by Lynn Meadows

WASHINGTON Everyone approaches the voting booth from a different perspective and with different issues in mind and at heart. A born-again Christian from Georgia will probably base his vote on different issues than the logger in Oregon.

While some broadcasters may base their votes on personal issues, others may be interested in weighing where the candidates stand on issues that could affect their businesses.

Spectrum auctions

The "Holy Grail" issue for broadcasters, as one NAB spokesperson said, is the spectrum auction proposal. With digital television on the horizon, many broadcasters are concerned the auction-happy FCC might force them to pay for digital spectrum in addition to paying for expensive new digital equipment.

In late January, just before the Telecom Act was finalized, Senator Dole questioned the "giveaway" of spectrum to broadcasters.

"As we look at ways to reduce the deficit," he said in a speech on the Senate floor, "let us not start a big giveaway program to some of the broadcasters in America who can afford to pay for it."

Clinton has proposed that broadcasters be given the spectrum they need for digital television at no charge as long as they eventually return their old frequencies. The old frequencies would then be auctioned.

"My point is that broadcasters have a long history of paying top dollar for existing channels," said Dole. "Somehow

President Clinton

they can't afford any new ones unless the taxpayer is gouged."

The campaign of Ross Perot stated that because the public owns the airwaves, it should be appropriately compensated for their use and added that Congress should not hand the rights to our airwaves to special interests.

Broadcast spectrum auctions will have ramifications for radio as well. When and if the industry finds a standard for digital audio broadcasting, if new spectrum is required, the HDTV precedent will indicate how radio broadcasters will receive their spectrum.

Capital gains

The capital gains tax is the scourge of family-owned and other small businesses. Many radio station owners eager to sell and take advantage of ever-rising station prices have hesitated knowing they could face a capital gains tax of up to 35 percent.

At the end of 1995, while he was still a senator, Dole pushed legislation that would have cut the capital gains tax cut for businesses to 28 percent. President Bill Clinton vetoed the legislation for that and other provisions it contained.

In August, candidate Bob Dole promised to cut the top rate of the capital gains tax in half.

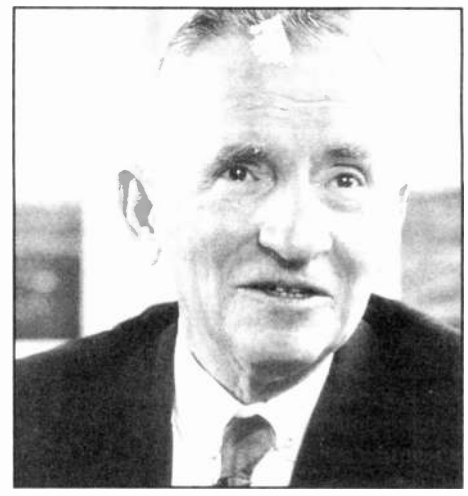
Observers note that Clinton would rather tax capital than labor and has no interest in lowering the capital gains tax rate.

The Perot position is that government should cut spending and the entire tax code should be rewritten so it is more fair and less complicated.

Children and the media

Another hot button during the Telecom debate was the V-Chip. The chip will allow parents to block out television programs that contain sex and violence. Where candidates stand on the V-chip could affect where they stand on other broadcast content issues during their presidential term.

Clinton is a keen proponent of the V-chip and even pushed it during his State of the Union address days before it became a law in the Telecom Act.



Ross Perot

In August 1995, when the hype over the miracle V-chip was working to a frenzy, Dole pointed out that the V-chip had not ever been tested and did not even exist.

"In fact, it's likely that the so-called V-chip technology will be overtaken by existing software systems — developed as a direct result of consumer demand — that will give parents more control over what their children watch on television," said Dole.

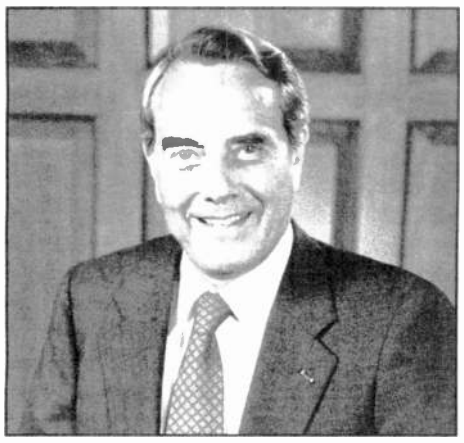
Under Clinton's leadership, the television industry agreed to develop a voluntary ratings system and to broadcast at least three hours per week of educational programming.

Dole spoke in favor of the voluntary ratings system but issued a caveat for broadcasters.

"The entertainment industry will not gain the confidence of parents if it believes that warning viewers about program content is a substitute for voluntarily producing more family-friendly programming that is suitable for children."

Perot believes that parents should have every cost-effective option available to them that will help them accomplish that responsibility.

The efforts-based rules of the FCC have long been a sore spot for many broadcasters. The rules stress the hiring process stations go through rather than the outcome. Even a station whose workforce mirrors the ethnic composition of its community can face fines of several thousand dollars if the FCC determines its recruiting process was not inclusive.



Robert (Bob) Dole

"President Clinton believes that we need to mend affirmative action, not end it," is the statement off the Clinton/Gore official Web site (http://www.cg96.org).

Dole is on record as opposing quotas, set-asides and other government preferences that favor individuals because they belong to a particular group.

"The key is to guarantee the opportunity to compete, not rig the results of the competition with quotas, set-asides and other preferences," Dole is quoted as saying on his official Web site (http://www.dole96.com).

Dole introduced the Equal Opportunity Act, which prohibits the use of racial and gender preferences in federal contracting, federal employment and programs wholly administered by the federal government.

Radio Plays Key Role

WASHINGTON The road to the White House is partially paved with talk radio appearances.

Republican presidential candidate Robert Dole realized that in early September when he hired Scott Maloni as Director of Talk Radio Operations.

Maloni said Dole made a commitment in September to do one national and one local talk show every day, except when his schedule does not allow it.

In spite of Dole's efforts, Maloni said he hears more negative comments from hosts unhappy about the candidate's tight schedule.

"There are 4,500 talk radio shows," said Maloni, "and only one Bob Dole."

Dole has done the Rush Limbaugh Show and the Oliver North Show, according to Maloni. The candidate has also appeared on the Imus in the Morning show.

The Republican candidate has also appeared on local shows like The Art Lewis show on WSGW(AM), Saginaw, Mich.; The Jim Jacobs show on WRVA(AM), Richmond, Va.; The Mike McConnell show on WLW(AM), Cincinnati; and The David Gold show on KLIF(AM), Dallas.

Maloni said Republican vice presidential candidate Jack Kemp does more local shows in markets he visits. The former Buffalo Bills quarterback has appeared on WWDB(FM), Philadelphia; and WSB(AM), Atlanta, to name just a couple.

Kim McCreery, deputy press secretary for Kemp, said he gets at least two or three requests for on-air interviews in every market. Kemp does anywhere from three to eight radio interviews each day, typically in 10-minute segments that do not involve call-in questions.

McCreery said the windows of free time for Kemp usually fall during drive times or in the 10 minutes between events.

President Clinton and Vice President Gore, meanwhile, are benefiting from a aggressive strategy by the Democratic National Committee.

Jon-Christopher Bua is the director of the Speakers Bureau/Talk Radio Initiative at the DNC. Their slogan is "Something New in Talk Radio — The Truth."

When the Democrats got "beat up" in the 1994 Congressional election, Bua said the party learned its lesson: "We've got to get on the air."

Bua and 15 volunteers spent more than a year canvassing radio stations and shows nationwide. They selected about 1,200 stations to get their message out.

The Speakers Bureau gets "scores" of calls each day, said Bua. And he said they make as many as they get. The goal is to get "presidential defenders" on the airwaves.

"It's been good for radio, I think," said Bua, who has done over 200 shows himself. He said when he goes head-to-head on The G. Gordon Liddy show, the phone lines always light up.

"We're not afraid to go into the lion's den."

U.S. Guests Help Bulgarian Radio

by Sharon Rae

PLOVDIV, Bulgaria From the Black Sea banks of Albena to the city of Sofia, a group of four American radio management professionals took a trip overseas in September.

Their mission: to work with the emerging commercial radio industry in Bulgaria.

Vesta Brandt is vice president and general manager of KNUZ/KQUE in Houston. She joined colleagues Gene Mater of Washington, Mark Bench of New York, and Don Smullen of Seattle for the eleven day venture to the Eastern European country.

The trip was sponsored by the International Research and Exchange Group out of Washington, D.C.

"It was a two-fold purpose," said Brandt of the journey. One purpose "was to help the 21 private radio stations in Bulgaria to establish an association so they can work together as an industry... and have some strength as an industry to deal with the many issues they're going to have to cope with."

The second mission of the group was to conduct seminars and help each station in various Bulgarian cities to establish sales organizations.

"We did seminars very similar to the kind you'd find at an NAB or RAB conference," said Brandt. "We talked about sales... marketing... management and structuring stations — issues that would be interesting to owners and managers of radio stations."

Brandt was assigned to the city of Plovdiv, where she worked with two different radio stations in developing skills and strategies. Brandt says she was fortunate to have had the opportunity to work with both TNN Radio and Radio Vesselina. The owner of Radio Vesselina, Vesselina Kanaleva, also owns several other radio stations and is in the process of getting licenses for other stations.

"They thought it would be good for her to have a woman to talk to and get that viewpoint as well," said Brandt. Other than some interesting copyright situations and economic challenges, Brandt said the Bulgarian radio industry managers had all of the same concerns as Americans.

"It was just like talking to a broadcaster anywhere in this country," said Brandt. As for basic differences in the radio sales arena, Brandt said the country's borders are only symbolic.

"The stations I was working with already had sales staffs and their questions were very much like the questions that I would hear from my staff here," said Brandt of the concerns. "Things like 'I can't get in to see this guy — what are your suggestions for things I might do to get him to see me?' or 'They take my ideas and then run them other places' or 'We're having trouble with our economy and these people say we can't afford it.' And we go through the same thing with them that we'd tell our own staff ... people that advertise when times are difficult increase their market share and therefore do better than people who do not so that when the recovery comes those people are stronger businesses. It's the same stuff! They cannot imagine that we have had (hard times)."

One aspect of radio sales, however, presented some unique problems in a country where the economy is unstable and banks are in jeopardy.

"They are certainly dealing with some stressful economic conditions," said Brandt. "Not that we don't ever have them, but they're dealing with a situation where banks are limiting the amount of funds people can withdraw on a daily basis because they can't afford to have a run on the bank. So they have a total per month that they can take out of the bank."

In addition, Brandt says the Bulgarian radio salespeople write their rate cards in American dollars.

"The rate of exchange is changing so rapidly that they can increase the number of Levas (currency) that they have to be paid for these schedules," explained Brandt. "So they can increase that so they are still securing a rate that would be equal, to, say 25 or 30 American dollars."

When asked about the technology of radio in the country, Brandt said while the Bulgarians do not have as much equipment as some of the major stations in America, they do have state of the art facilities.

"They buy European technology," she said. "One of the stations I worked with was using digital and storing their commercials on DAT and they were using CDs to play their music on the air. The other station was still using cassettes but they had another production studio that's one of the biggest in the country and that's where a lot of the musicians in Bulgaria record. And they have the capability of going digital there. So they had good equipment, just not as much of it.

"These people are serious about being in business," continued Brandt. "Many of them have been to America or have somebody in their organization who has been here to an NAB session."

And despite a language barrier, Brandt said all parties were able to communicate reasonably well.

"They were very friendly," said Brandt of her hosts. "They treated me like I was one of their staff. A member of their family. They were very open and receptive to ideas.

"It was a great experience. I'd do it all again. It really makes it easier to come back and tell your sales staff 'You think you've got it tough.'"

The Day the Music Died For a While at Westwood

by Lee Harris

CLINTON, Iowa Whatever you may think about satellite delivered music formats, this much is indisputable: The delivery systems are extremely reliable.

Whether it is Satellite Music Network, Westwood One, Jones Satellite Network or any of the other major operators, station owners know that they can count on the signals to keep hitting the dish and deflecting those VU meters.

So when the audio died simultaneously on KCLN-FM and KLNT(AM) in Clinton, Iowa, it never really occurred to General Manager Gene Kauffman that he had lost both his feeds from Westwood One.

It was about 1:30 p.m. on Tuesday, Oct. 1 when the silence sense alarms sent bells ringing and lights flashing.

"Our Chief Engineer Bill Dieckman was doing some maintenance outside. Actually, he was painting windows on a beautiful Iowa day," Gene explained. "He went running inside and found that both transmitters were running. Next he checked the digital satellite receivers. They were still working but there was no signal."

Bill tuned in a nearby radio to a station down in the Quad Cities which, like KLNT, runs Westwood's AM Only format.

There was nothing on the air there either. That pinpointed the source of the problem as something system wide, but what was needed now was at least a temporary solution to the dead air.

"We were only without audio for about a minute or two," Gene said. "It's the only time we ever lost both stations at once. Luckily we were about to start our live afternoon show on the FM station, so that wasn't a problem. We never use our AM studio except in emergencies and obviously this qualified. We keep a library of CDs and carted music. We fired up the board and started running the AM as if it were still on automation, playing all the liners and spots right on schedule, except we did it the old-fashioned way, by hand."

With the on-air situation stabilized, Gene started dialing Westwood One in California. All lines were busy.

"We assumed there was some major problem. We even checked the Associated Press to see if California had suffered an earthquake."

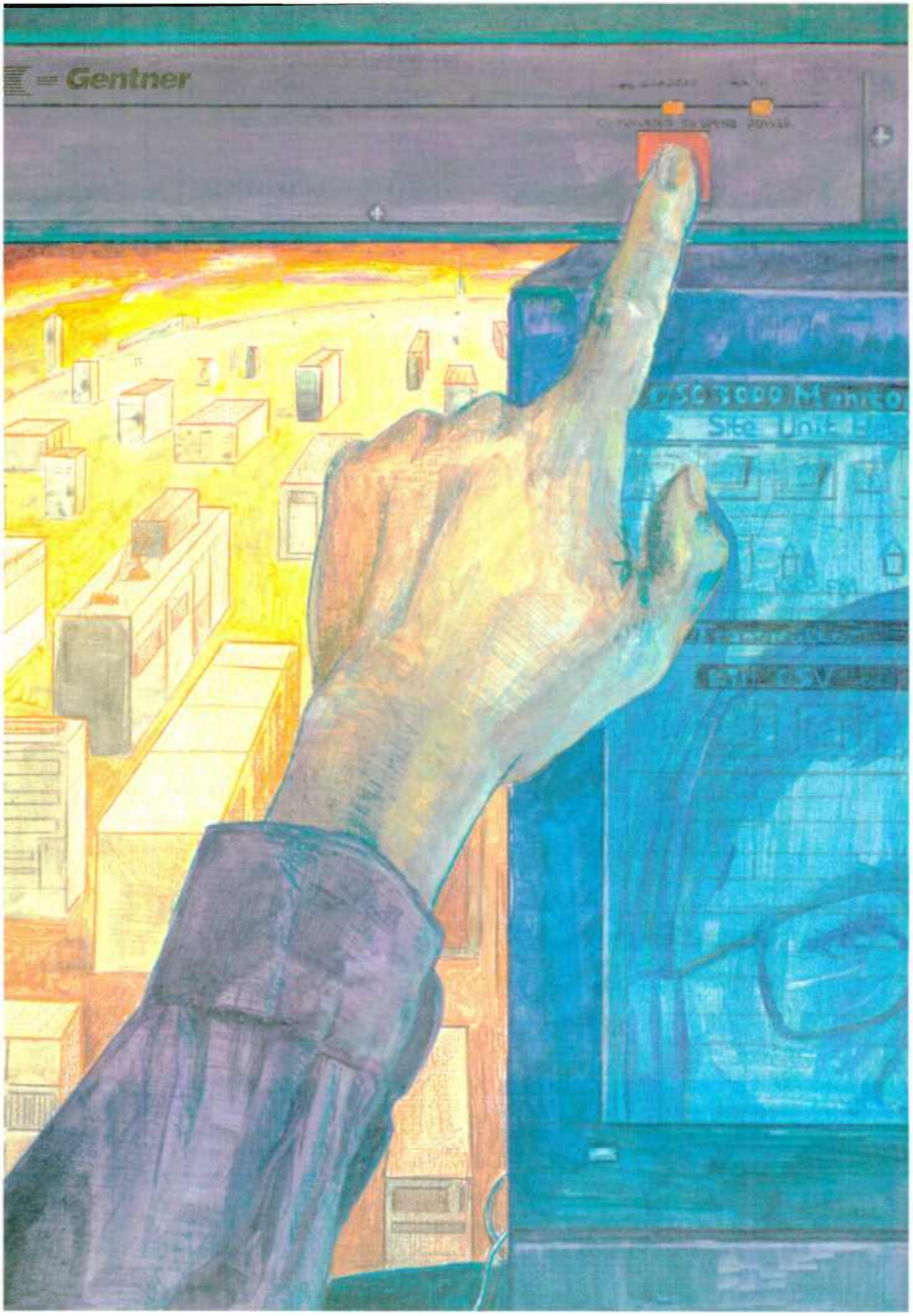
Eventually Gene got through.

"They told us all their formats were off and that it would take about an hour to restore service. That was around 2 p.m. I figured no problem, we have lots of people around the building."

Around 5:30, with the feed still out and no word on when it would be back, Gene started dialing around for part-timers.

"We normally have only one person here at night to operate both stations on full automation, and we were going

continued on page 16 ▶



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For more information on the GSC3000, contact Harris.

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Time Dwindling for Dark Stations

by Matt Spangler

WASHINGTON Several months after its ruling that dark stations have a year to get back on the air or risk losing their license, the Federal Communications Commission has made some progress in addressing the problems faced by dark stations.

Some stations, however, are still unaware or critical of the mandate.

Back on the air

The commission has taken "affirmative actions" with stations that "are interested in or capable of getting back on the air," said Stuart Bedell, assistant chief of the Audio Services Division (of the FCC.)

He said that some 35 stations that have been silent for "a considerable period of time" have been slotted for hearings on the status of their licenses.

Some of the stations that have been reviewed by the commission since its ruling have had their licenses canceled, other stations have had licenses renewed and still others are being re-evaluated.

The ruling, which is mandated by the Telecommunications Act of 1996, states that the license of any broadcast station that remains off the air for any consecutive 12-month period will expire "notwithstanding any provision, term or condition of the license to the contrary."

As of September 27, the FCC listed 151 AM and 57 FM stations as having been silent for at least six months.

The responsiveness of stations under review has been somewhat erratic. Some stations have been present for their hearings and some have not. Bedell said that, in the case of the latter, the commission can only presume that the stations are either unable or unwilling to power-up.

On the other hand, the commission ruling has not provoked a wave of "hysterical calls," said Bedell. A few stations have even voluntarily surrendered their licenses for cancellation.

Still unaware

Surprisingly, some silent-station owners and managers are still in the dark about the congressional mandate and the FCC's ruling.

Representatives of several stations claimed that they had not heard of the legislation or the ruling. When asked what they thought about it, they said that they supported the authority of the FCC in this matter, but that the ruling seemed to lack flexibility.

"If there is a legitimate reason you're off the air, you shouldn't be affected [by the ruling]," said Gerard L. James, general manager of WSTX-FM in the Virgin Islands, which has experienced a particularly threatening hurricane season.

Station owners and managers who have been aware of the ruling vocalized their concerns.

David Eaton, president of WMCL(AM) in McCall, Idaho, said that "the ruling gives the FCC little latitude in the individual circumstances of dark licenses," and that it does not account for the range of issues that extend far beyond financial ones that "complicate the building and programming of a station."

George Zarris, owner of WBGB(AM) in Mount Dora, Fla., who has encountered difficulties with zoning laws in the Florida county in which he wishes to construct a new tower for the station, echoed Eaton's sentiments. He said he is in favor of the legislation, but that "the government must understand that there are extenuating circumstances."

An ordeal

A station owner in Mississippi who wished to remain anonymous said that his negotiations with the FCC have been "an ordeal." All owners voiced criticism about the "bureaucracy and red tape" that they have encountered.

The fears of stations that are encountering difficulties like these may be somewhat unfounded, however. Barry Umansky, deputy general counsel at NAB, said that the legislation does not apply to stations applying for CPs or stations experiencing difficulties in obtaining zoning permits or similar problems with initially putting a station on the air.

The ruling instead deals with "stations that were licensed and operating and then, for one reason or another, did not operate for an interim period."

The actions being taken as a result of the legislation should be nothing new to stations, either. For a number of years prior to the passage of the Telecommunications Act, the FCC cracked down on stations that had been silent for a long time, issuing "orders to show cause" to licensees

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When the Bird Dies

▶ continued from page 14

to need at least one more staffer if we wanted everything to sound as normal as possible."

Around 6 p.m., just as Gene and engineer Dieckman were flipping a coin to see who would have to stay and run the board on the AM, the satellite feed crackled to life through the cue speaker.

What was the problem back in Valencia, Calif., headquarters of Westwood One's music formats? The company has not been overly anxious to discuss the situation, but according to sources inside the operation, some maintenance was being performed on the back-up transmitter for the satellite uplink when the main transmitter popped.

Apparently even a fully redundant operation is no match for just plain bad luck. Chief Engineer Larry Wilson told RW that it was not a problem with the new digital VirteX Starguide transmission system, which is being phased in as a replacement for the current analog satellite feed for all affiliates.

While Gene Kauffman had his hands full with his own problems the day of the outage, he could not help but wonder about the plight of other affiliates with fewer resources.

"How about that new breed of Mom and Pop stations, where Pop is out making sales calls and Mom is busy answering the phone and there's nobody else on the payroll? I wonder if some of the fully- automated stations even have much of a music library to fill time if the bird goes down?"

Amazingly, the bird rarely if ever does go down for these stations. Unattended operation would be suicidal if such outages occurred with any kind of regularity. Radio purists might argue that unattended operation is a bane upon the industry and maybe there should be more outages.

But these are the same people who in an earlier era would have been complaining about the demise of studio orchestras and the dismissal of actors on local radio soap operas.

Savvy station operators always have a high degree of redundancy built in to their operations — back-up transmitters, studios, studio-transmitter links, and in many cases, auxiliary power generators in case the local utility cannot supply the necessary AC.

As far as we know, no station has a back-up affiliation with a second satellite network to supply long form music programming in the event of an outage. While the Westwood One outage was relatively brief, the very abnormality of it serves as a reminder of just how reliable these services have been.

□□□

Lee Harris is morning anchor at all-news WINS(AM). Contact Harris or his website design company, Harris Media, via e-mail at lee@harrisnet.com

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Audio Output	-10 to +10 dBm bal. @ 600 Ohms XLR Comm.
Line / Monitor Output	Up to +10 dB unbalanced (Parallels internal speaker data)
RS 232 Ports	1 - Remote Computer 1 - Character Generator 1 - Optional Printer Port (if no printer is present)
ON-AIR Relay	Dry Contact direct 125V / 1A
ALERT Relay	Dry Contact direct 125V / 1A
RS 485	Multi-drop remote control for Extension Units, Automation Systems, and Accessories

STUDIO CONTROLS	
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Shared Data Next Stride for Radio

by Paul J. McLane

OS ANGELES Say "audio." Think lata."

That new formula gives broadcasters excit-g powers, according to Tom Rodman, anager of digital product marketing for roadcast Electronics Inc. Rodman dis-issed "Positioning Yourself for the Future Digital Audio" at a session sponsored by e SBE Engineering Conference.

A walk on the exhibit floor revealed the ite of digital audio. Products included w digital on-air consoles, digital citers, automation hardware and soft-are, and audio codecs. But the next ve, said Rodman, is interconnectivity, e sharing of data between facilities.

Now that audio can be stored as com-ter files, the networking of audio can as easy as drag-and-drop manipulation any word processing file. A user in ague can share data with a bureau in oscow. A group owner in Florida can connect its many stations. Syndicators and news feed services can distribute their audio more easily.

It is not a new idea. The communica-ons industry is catching up with bank-g and retail, Rodman said.

The communications industry is catching up with banking and retail.

"In the past, our industry's meat and otatoes, sound, couldn't be moved ound. But now it can. Radio is finally ised to take advantage of these existing chnologies."

"Many stations are already networking Cs to manage digital audio within a cility," he said. "The next step is wide-ea technologies, WANs.

"For example, if we have a half-dozen ations in New York and a half-dozen in .A., a lot of our audio inventory is the me. It's neat to be able to share that ventory, and to share production loads. aybe the production people in New ork are booked up, but the guys in L.A. ve the time today to work on a project.

"Now that we can establish links any-here in the country, anywhere on the obe, resources can be shared in ways e haven't even thought of."

Rodman drew a distinction between this nd of networking and the type of con-ection provided by popular digital odecs, which many stations use for digi-tal feeds.

"They essentially create a dedicated audio line," he said. "It's a high-quality line, but (the transfer) is still manual and point-to-point, in real time."

By comparison, the WANs described by Rodman use a variety of methods to move data — computer files containing audio — from place to place, including satellite systems, on-demand dial-up ISDN and the Internet. Broadcast Electronics and other manufacturers are aiming for that marketplace, to provide the "glue" that turns tomorrow's "super groups" into profit machines, in Rodman's description.

"Because digital audio is nothing more than data, it stands to reason that the very fabric of radio — sound — will benefit from these new technologies."

The session was intended for management operations people and station managers as well as engineers. Rodman presented some visions of the future and explored how every aspect of radio, from programming to sales, benefited.

"Anyone following this, even on the fringe, knows this is all coming," he said. "Stopping to get a grip on the terms and how they fit together is something that people in our business should be doing."

Rodman was a syndicated radio personality in Chicago who spent six years on the ABC Radio Networks StarStation format. He developed two of the first hard disk digital audio systems, "The Desk Jockey" and Bonneville's "TruePlay," and is part of BE's cooperative project with Pacific Research & Engineering on the future of networked digital audio.

Rodman is among the speakers who took part in Saturday morning's series on "Storing and Networking Audio." Other topics included digital backup, multimedia storage systems, RAID systems, distributed storage and the next generation radio station electronic communications system.

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Duopolies: Finding What Works

by Bob Rusk

LOS ANGELES What are the rules for the new super-duopolies? And once stations merge, how should the sales departments be structured? These questions were discussed during "The Seven Super Secrets of Super-Duopolies," and "Restructuring the Merger-Mania Sales Team."

Chuck Mefford, of training and consulting firm Mefford Achievement Systems and senior vice-president of group-owned Mid-West Family Broadcasting, presented the first session.

"Secret number one is, there is no one solution," said Mefford. "There are so many variables — including the station's heritage, format, and corporate culture.

"I have researched over 100 successful duopolies in markets of all sizes and have discovered there are a hundred different ways up the mountain, but there are proven things you can do. By combining stations, for example, you can finally compete for newspaper advertising dollars. However, if you still sell like traditional radio, all you're doing is cutting up the same radio pie — which means there will be a lot of people not making note payments down the road."

The second secret Mefford presented is, "If you don't cut out the 'us' versus 'them,' it can kill you." This is particularly significant for stations that once were fierce competitors, but now find themselves under the same ownership.

"Habits aren't erased overnight, yet you have to find a way to merge as quickly as possible," stressed Mefford, "otherwise you'll be ripped apart at the seams." Mefford shared proven ways to accelerate the process and build a strong, unified team.

The second session was moderated by Riki Pritchard, sales manager at EZ Communications' KZOK-FM in Seattle. Panelists were Deborah Parenti, vice president/general manager, American Radio Systems, Dayton, Ohio; Graham Satherlie, vice president of sales, Chancellor Broadcasting, Denver; and Lindsay Wood Davis, the AdVisory Board, Madison Wisconsin.

Once the sales departments are structured, many questions still must be answered: Do you sell by the numbers? By format? How many sales people are needed? How many sales managers?

Again, there are no specific solutions; it is a matter of finding what works best for each company. The six ARS stations in Dayton operate with a single sales force consisting of two sales teams; but the four EZ Communications stations in Seattle have separate sales staffs.

"It's like there are four radio stations competing against each other," said Pritchard. "We have a manager for each sales staff and one general manager over all of the stations.

"There is a sales meeting once a week and we stay in close communication regarding rates and the sharing of leads. I can't see any other way of doing it."

Parenti, however, prefers to follow what she terms "the national rep format of selling." She said, "We have a director of sales, who is in charge of the overall operation." Two general sales managers report to her.

"We call the sales department Radio First, which gives them not only a name, but also an identity. When advertisers think of marketing and are looking for solutions, we want them to think of radio first."

As a way to increase revenue, Parenti is eager to go after newspaper budgets, but points out that sales people must have all of the tools necessary to get the job done.

"We wouldn't send them out without an Arbitron or format descriptions," she states.

"If we are to go after non-radio users, we must have the right ammunition. That can't be generic national information; it has to be local information."

"With the nationwide frenzy going on as a result of conglomeration, the timing is perfect for these sessions," Pritchard said. "There is no right or wrong. What we're seeing are a lot of companies finding new ways to approach sales."

Session Reveals New Realities of EAS

by Lynn Meadows

LOS ANGELES The FCC expects that in about two months, states, localities and radio and television facilities will have the new Emergency Alert System (EAS) on line.

By Jan. 1, 1997, radio and television stations will have to own equipment that can accommodate the new EAS, and states and localities must have their plans for EAS activation in place.

There were no safety nets if one part of the chain went down.

The switch from the Emergency Broadcast System (EBS) has generated a lot of questions. Some EAS insights and answers were found at the "EAS My Way — Radio" session of the SBE Engineering Conference.

Bill Ruck, engineering manager of KFOG(FM) and KNBR-TV, moderated the session, and Andy Ellis, assistant technical supervisor of KCBS(AM), San Francisco, spoke about EAS from his perspective.

KCBS is part of the CBS Radio Station Group. Ellis addressed EAS issues that arise in multiple station operations. For instance, the Federal Communications Commission indicated it will allow co-owned and co-located radio stations to use just one EAS box. In light of continuing radio consolidation, that was good news to some owners.

Acting EAS Director Frank Lucia even said that co-located stations that are not co-owned might be granted a waiver to use one box if they can prove they can get the information back and forth. But Ellis said he wants to make sure broadcasters do not make penny-wise, pound-foolish decisions, such as trying to make one EAS box suffice for four stations.

Also on Ellis' agenda was a discussion of primary entry point (PEP) stations under the new EAS. PEP stations like KCBS have traditionally been used for national emergency activations like those prompted by the president.

California is one of the more advanced states in terms of EAS planning. Up until late August, there were some states that did not even have state emergency chairs.

The San Francisco Bay area finished its local area plan, which has already been approved. Ellis discussed details of that, as well as the state EAS plan.

Well-crafted plans will be an important part of the new EAS system. EAS will be a "web" system instead of the traditional "daisy-chain" of the EBS.

Traditionally, one radio station passed the message to another which passed it to another. There were no safety nets if one part of the chain went down. With the web-like EAS system, broadcasters will have to monitor at least two other stations. If one link goes down, hopefully the other will still work.

Ellis also talked about the "down-to-earth realities in the EAS world." He said there is a misconception among people right now that the tests will be quicker and less audible than they actually are.

Broadcasters with questions about the EAS system need to start exploring their options now and discussing their monitoring assignments with their local chairmen. Thursday's session was interesting and informative, but it will be up to attendees to carry the ball over the finish line in the next two months.

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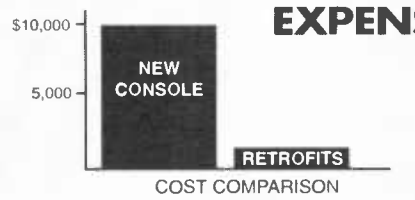

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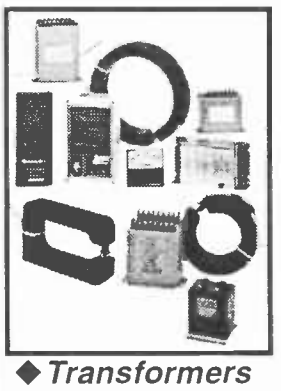

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Afraid of The Dark?

▶ continued from page 16

that were off the air for, in some cases, many years.

What the ruling has in fact brought about is a tightening of the commission's insistence that silent stations get back on the air.

The NAB seems to support the commission's initiative. Umansky said that "it's more than useful for stations that are given licenses to employ them, and that other broadcasters will seek to expand their facilities if it turns out that someone is not using a frequency on a co-channel or an adjacent channel."

Some owners and managers are still in the dark.

For its part, the NAB has briefed its members on a number of occasions regarding the provisions of the Telecommunications Act, Umansky said.

The FCC seems to be making efforts to accommodate the disparate needs of individual stations. It announced that if a station's facilities need to be modified, the commission will make every attempt to expedite that station's application. Bedell said that the FCC has received a number of letters labeled "Request to Expedite Application of Silent Station," which have been treated accordingly.

Bedell said that under certain conditions a station can apply for a license that has been taken away from a dark station.

"If the station's license is lost and canceled and the allocation from an FM standpoint remains in place, or if an AM licensee could engineer a station that he wants on the frequency that had been vacated, then yes, the license could be applied for."

Where All the Engineers Have Gone

by Christine Joaquim

LOS ANGELES In the ever-changing world of radio, it is understandable for engineers to be anxious about job security, salary and work environment. An engineer today must be a hands-on, computer-literate, jack-of-all-trades.

If you are in the market for an engineer, or think you might be soon, the session for you at the NAB Radio Show was "Where Have All the Engineers Gone?"

Jo Guck Bailey, general manager at KYSM-AM-FM and KXLP(FM) in Mankato, Minn., moderated the session. The panel included Eric Hoehn, engineer at Radio One Washington; Ron Kazda, director of engineering at KSTP(FM); and Bill Suffa, vice president of strategic development at Jacor Communications.

Numerous reasons

The reasons for the dwindling number of radio engineers are numerous. The rapid expansion of multiple station ownership has created an environment where owners are using fewer engineers for more and more stations.

Radio engineering is not the hot career field it used to be, either. The computer industry is the place to be right now. Even though broadcasting has become more high-tech, the majority of positions are RF technology based from transmitters.

Also, radio has become a more profitable business, so backup facilities have become more prevalent.

If there is a breakdown overnight, the station is able to stay on the air and call someone when it is more convenient; consequently the use of contract engineers has become more commonplace.

And with the dependability and advancement of equipment today, less monitoring is needed. Hoehn drew a comparison to a television breaking down at home.

"You want a repairman to fix it and leave. You don't want him to live there."

Lastly, salaries are not as high as those in the business or high-tech industries, and engineers who are working in radio feel undervalued and expendable. There are communication difficulties between engineering and management that exacerbate that, said Suffa.

"Say you're making $20,000 as a radio engineer. You could probably make $40,000 working in the computer field. What would you do?" he asked.

The good ones are taken

Bailey has spent the last year-and-a-half trying to fill four positions. So far, she has found only one qualified engineer.

"All the good ones are taken ... there are enormous opportunities outside of our field."

Hoehn agreed, pointing out those who do not want to work in such a chaotic environment have moved on to greener pastures where there is more predictability.

"You want be at a place where you know you'll have a job in a month," he said.

Bailey said the number of training facilities has declined, and there hasn't been a way to compensate for that.

She pegged the mid-40s as the average age of an engineer in Minnesota. "There's going to be a severe shortage soon. We definitely haven't taken care of our own," she said.

Methods for Measuring Guy Tension

by Troy Conner

Part II

BRASSTOWN, N.C. As noted in the Oct. 2 issue of RW, we classify methods for measuring guy tension as direct or indirect.

The configuration and type of cable connections, or guy termination hardware, dictate the type of direct method chosen to check tension. To check and adjust turnbuckle-equipped smaller structures, we normally use cable grips, a "come-along" and a dynamometer. Some of the more technologically advanced tower firms use a digital load cell in place of the old, analog-style dynamometer. On larger towers with U-bolts and socketed guys, crews perform the task with a hydraulic jacking system.

Get the mallet

A promising indirect method of determining guy tension has caught my attention. Progressive builders of cable-stayed bridges measure tension with an accelerometer. Paired with a pre-programmed hand-held signal analyzer, it measures units of acceleration via a mass temporarily attached to the steel bridge strand. Guy tension can be related to mass, unsupported length and the cable's fundamental frequency of vibration. Dynamic vibrational analysis allows the crew to calculate tension merely by striking the cable with a rubber mallet to induce vibration. The obvious advantages of the accelerometer are its size, accuracy and potential speed of use.

Crews usually check tower plumb and guy tension concurrently; logic and logistics dictate that the operations be run at the same time. Checking tensions and plumb are straightforward mechanical procedures. Correcting them is a far more complex cerebral exercise, requiring considerably more exertion.

During the learning process, you may feel like a dog chasing its tail. After a while, you learn to develop a mental, spatial picture of how the tower is standing, and how to pull or release the guys to plumb the structure, and simultaneously achieve the correct cable tensions. In general, the taller the tower, and the greater the number of guys, the greater your potential headache.

We determine tower plumb and twist by "shooting" the structure with a plungeable theodolite (a vertically capable transit), charting the deflections from plumb at each guy level and performing some simple calculations. We can sight the tower in a number of ways. A quickie shot requires readings from two transit stations, one shot parallel to a guy line and another 90 degrees perpendicular to the opposite face. This type of setup provides the basic information regarding the overall plumb of the tower.

How many legs?

Three- and four-legged structures present some fundamental differences in basic physics. As a result, plumbing and tensioning procedures vary slightly. Theoretically, we can determine the guy tensions of a three-legged structure by checking one "lane" or "alley" of guys, because the tension load at each level should be equally distributed between the three catenary systems. This type of quick and dirty tension check does not adhere to the EIA/TIA standards.

According to the standards, each cable in a three-way guyed tower must be checked for tension. Three transit stations are then required to determine tower twist and deflections out-of-plumb for a three-way guyed structure. On a four-way guyed tower, we need only check two sets of cable tensions, at anchors 90 degrees to one another. However, we require four transit setups when "shooting" a four-way guyed structure to measure both plumb and twist accurately.

Despite close design tolerances, the manufacturing process unavoidably causes some plumb and twist deviations. Thanks to the use of multiple, multi-legged sections, some plumb and/or twist error is inevitable and cannot be corrected by any amount of tension adjustment. Additionally, we must acknowledge the effects of wind on the structure, during both the transit and tension work. Finally, expect some variation due to thermal expansion and contraction. A tower chilled during the night will actually bow towards the sun slightly as it warms and slowly stabilizes in temperature. Bear in mind that there is no such thing as a perfectly plumb tower, nor one in which the actual tensions are at the exact design values.

Let's not do the twist

Twist is usually given for each guy level, in either degrees or inches of rotation. The twist is further defined as either clockwise (CW) or counter-clockwise (CCW) as viewed in plan form, from overhead. Tower twist, for the most part, is not correctable. However, given the five-degree total twist permissible in a structure, few are outside of the acceptable engineering parameters.

Typically, a proper check and adjustment of a tower's plumb and guy cable tensions can take anywhere from a half day to more than a week. The actual time depends upon a number of factors including the complexity of the guy system, its original and existing conditions, access to the guy anchors, the general terrain, the speed and skill of the crew, the precision of the work, the range remaining in the turnbuckles or U-bolts for adjustment, and Mother Nature. Wind and weather can play absolute hell on your anticipated schedules when you are trying to plumb and tension a tower.

PS — I am always interested in hearing from station owners, chief engineers, tower firms or other readers with criticism, comments, corrections or just good tall tower tales. My numbers appear at the end of this story. We also appreciate documentation about structural collapses or tower failures for our archives, including newspaper clippings, photographs or whatever else.

□□□

Troy Conner is the owner of Tower Maintenance Specialists. Reach him by phone at (704) 837-3526 or via fax at (704) 837-1015.

CIRCUIT THEORY

Determine AC Voltage

by Harold Hallikainen

SAN LUIS OBISPO, Calif. In the most recent article in this theory series, we noticed that the instantaneous voltage for an AC voltage is changing continuously as a function of time. The most common AC waveform is a sine wave. The voltage at any instant in time for a sine wave can be determined as:

V(t)=VP*sin(wt) where VP is the peak voltage, w (omega) is the frequency in radians per second (equivalent to 2*pi*f where f is the frequency in Hz),and t is the time since the waveform started.

This equation assumes the sine function is based on an angle in radians (instead of degrees). We'll be switching back and forth between using degrees and radians, depending upon which gives us the simplest math. Find that radian/degree switch on your calculator! We can also add a constant for phase shift, but we'll leave that for later.

We are ... here!

Quite often we are interested in where we are in a waveform in terms of how much of the cycle we have completed instead of how many seconds, microseconds, or whatever, because the waveform began. Again, we can use either degrees or radians. If we want to know the instantaneous voltage of a sine waveform at any point in a cycle, independent of frequency and time (since we'll use phase instead), the above equation becomes:

V(a)=VP*sin(a)

where VP is the peak voltage and a is how far we are in to the waveform in degrees or radians (depending upon which sine function we're using). Table 1

continued on page 24 ▶

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Circle (12) On Reader Service Card

Average AC Voltage

▶ continued from page 22

shows the voltage at various points through a single cycle of a 1 volt peak sine wave.

Now that we can determine the instantaneous voltage at any point in the waveform, let's determine the average voltage through one cycle. The average is also known as the arithmetic mean. We can simply add up the instantaneous voltages and divide by the number of voltages we've added. Notice that the sum is zero? For every positive voltage during the first half cycle, we have an equal negative voltage during the second half cycle.

If you connect a DC meter (which mechanically averages the instantaneous voltages) to an AC source, it will read 0 V, since the average is indeed 0 V. However, the average for a half cycle is not zero volts. If we average the first half cycle (the first eight voltages in the table above), we get about 0.615 V. This is approximately the average voltage during a half cycle.

For a more exact determination of the average voltage of a half cycle, let's reconsider how we determine the average. If, for example, you travel 10 miles per hour for one hour and 20 miles per hour for two hours, you might be tempted to say the average speed is 15 miles per hour (add the speeds and divide by the number of speeds).

However, we must instead determine the total distance traveled (10 miles + 40 miles), then divide by three hours, yielding 16.667 miles per hour. Our new definition of average is "the sum of the products of the value times the amount of time we spent at that value, divided by the total time."

Smaller and smaller

Applying this to the voltages in a sine wave, we can approximate the average voltage as shown in Figure 1.

In Equation 1, sigma indicates we're taking the sum of several terms, V(t) is the instantaneous voltage, and delta t (Δt) is the change in time from this time to the next time we determine the voltage. Because the voltage is changing continuously, it really doesn't spend any time at a particular voltage. Therefore, we keep increasing the number of samples and multiplying them by a smaller and smaller delta t. The limit of this smaller and smaller approach turns the summation into an integral and turns delta t into dt. So, if we say the average voltage can be computed using the integral in Equation 2, you know where it comes from!

Figure 1.

$$V_{AVG} = \Sigma \frac{v(t)\Delta t}{T}$$

$$V_{AVG} = \frac{\int_{t=0}^{\pi} v(t)dt}{T}$$

$$V_{AVG} = \frac{\int_{t=0}^{\pi} \sin(t)dt}{T}$$

$$V_{AVG} = \frac{-\cos(t)\Big|_{t=0}^{\pi}}{\pi - 0}$$

$$V_{AVG} = \frac{-\cos(\pi) - (-\cos(0))}{\pi}$$

$$V_{AVG} = \frac{1-(-1)}{\pi} = \frac{2}{\pi} \approx 0.637$$

Equation 2 is a definite integral. We are to do this infinite number of multiplications and additions for t values between 0 and pi (radians). Substituting the function for a 1 volt peak sine wave, we get Equation 3.

This value of this definite integral is determined by taking the definite integral of sin(t) dt, which is -cos(t) (we'll leave the calculus details for another time!),

Table 1.

Radians	Degrees	Volts
0	0	0
0.392699	22.5	0.382683
0.785398	45	0.707107
1.178097	67.5	0.92388
1.570796	90	1
1.963495	112.5	0.92388
2.356194	135	0.707107
2.748894	157.5	0.382683
3.141593	180	0
3.534292	202.5	-0.382683
3.926991	225	-0.707107
4.31969	247.5	-0.92388
4.712389	270	-1
5.105088	292.5	-0.92388
5.497787	315	-0.707107
5.890486	337.5	-0.382683

and subtracting the integral evaluated at the lower limit from that evaluated at the upper limit. This is shown in Equation 4 where the evaluation limits are shown to the right of the -cos term.

These evaluation limits are inserted in Equation 5.

Finally, the values of cos(pi) and cos(0) are substituted in Equation 6. This yields an exact value for the average of a half-cycle of a sine wave as 2/pi, or about 0.636 times the peak voltage.

Next time, we'll evaluate the Root Mean Square of a sine wave. To start you thinking, we're going to take the square root of the average of the squares of the voltages. We'll also discuss why we do that.

□□□

Harold Hallikainen designs transmitter control and lighting equipment for Dove Systems, a manufacturer serving the broadcast and entertainment industries. He also teaches electronics at Cuesta College and is an avid contra dancer. Call him at (805) 541-0200, fax (805) 541-0201, e-mail to hhallika@slonet.org, *or visit him on the Web at* http://slonet.org/~hhallika *where an archive of these articles is maintained.*

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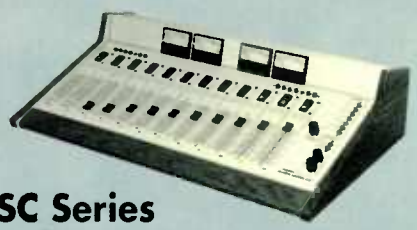

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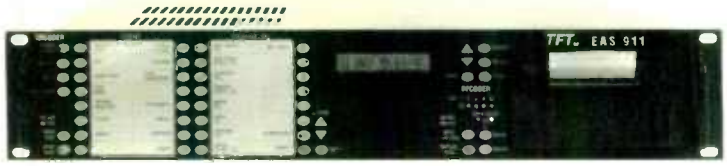

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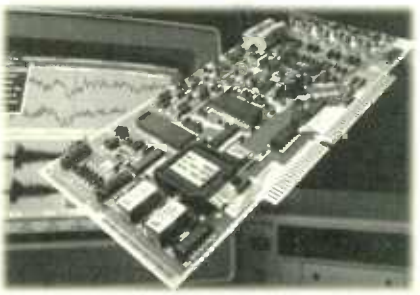

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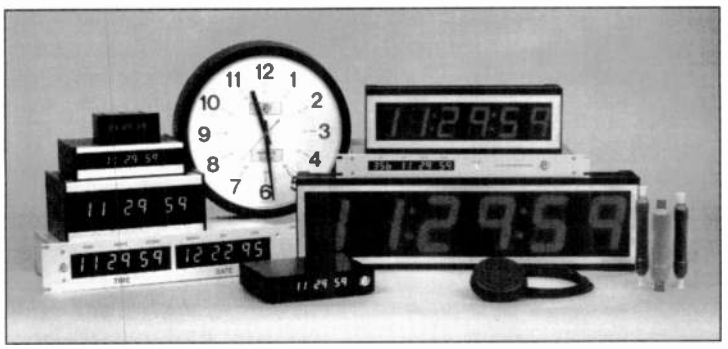

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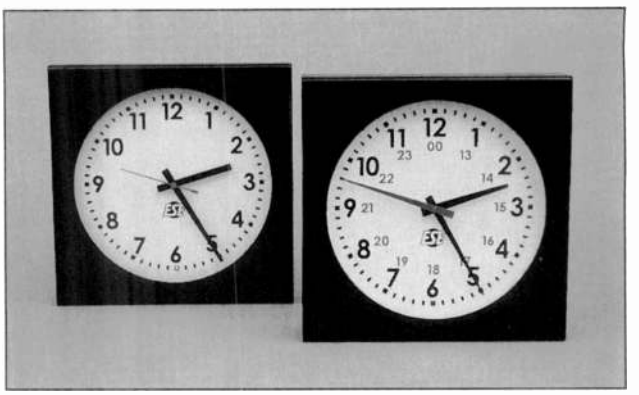

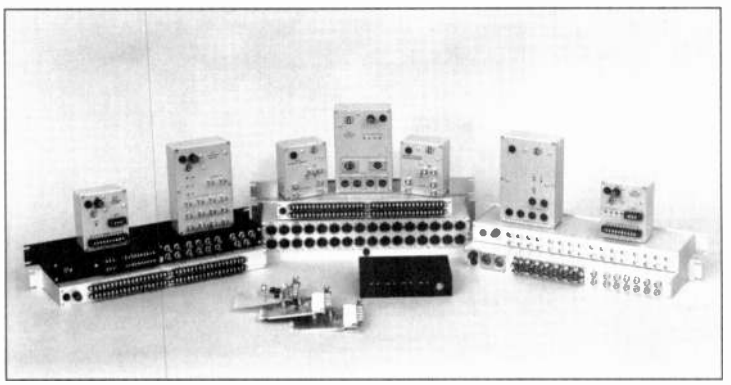

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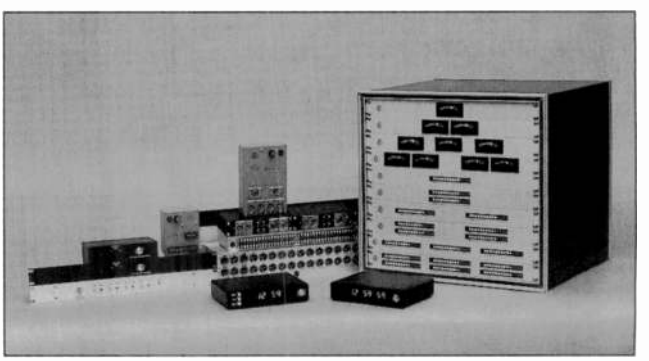

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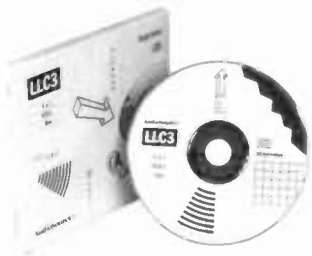

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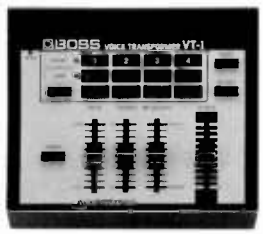

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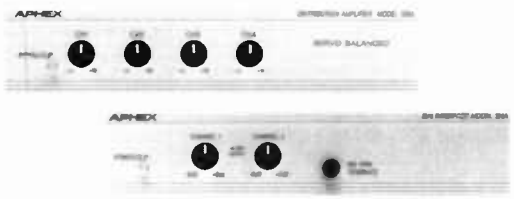

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1	CCS	M56	demo	mono digital codec	$2,145.00	$1,195.00
1	Gentner	EFT1000A	new	telephone frequency extender	$1,599.00	$995.00
1	Gentner	EFT900A	demo	telephone frequency extender	$999.00	$699.00
1	INC	101SDT10A	new	CM1056S switched 56 CSU/DS4	$895.00	$578.00
1	INC	101TDT10A	new	CM1056 switched/dedicated 56 CSU/DSU	$1,950.00	$1,192.00
1	INC	101TSR10AD	new	Single rackmount CM1056 CSU/DSU	$1,595.00	$986.00
Microphones and Accessories						
10	AKG	D3800	new	cardioid vocal mic	$246.00	$129.00
3	Crown	GLM100	new	miniature omnidirectional mic	$209.00	$139.00
1	Crown	GLM100	demo	miniature omnidirectional mic	$209.00	$99.00
3	EV	D054	new	omnidirectional mic	$212.00	$88.00
4	EV	ND757B	new	cardioid handheld mic	$410.00	$179.00
4	EV	BK1	new	cardioid handheld condenser mic	$215.00	$129.00
1	Sennheiser	MD422	new	cardiod studio mic	$579.00	$299.00
2	Sony	ECM55PBT	new	unidirectional lav mic (black)	$270.00	$99.00
2	Sony	ECM55PST	new	unidirectional lav mic (silver)	$270.00	$99.00
1	Sony	ECM44PBT	new	omnidirectional lav mic (black)	$135.00	$79.00
Wireless Microphones						
1	Telex	71084065	new	FMR100C wireless lapel (171.905)	$904.00	$595.00
1	Telex	71162-065	new	ProStar wireless lapel	$400.00	$239.00
1	Samson	SWM3H5A	new	Handheld wireless chan. 8	$895.00	$499.00
1	Samson	SWAGL7	new	Lapel Diversity chan. 2	$420.00	$259.00
1	Samson	SW35C4	new	Lapel Diversity chan. 13	$700.00	$359.00
1	Samson	SWTSCM	new	Lapel Diversity chan. 6	$1,649.00	$895.00
1	Samson	SW13SHE	new	Handheld Diversity multichannel	$2,399.00	$1,399.00
Misc. RF/Transmission Equipment						
1	Moseley	DSP6E2	demo	DSP6000 Digital STL encoder	$2,995.00	$2,495.00
1	Moseley	DSP6D2	demo	DSP6000 Digital STL decoder	$2,995.00	$2,495.00
2	Mod Sci.	RDS1	new	RDS Eccoder	$1,750.00	$699.00
Misc. Studio Equipment						
1	Russco	FMSB	used	phono preamp	$324.00	$99.00
1	ATI	HD100	used	headphone amplifier	$199.00	$149.00
1	R. Syst.	TM-3	new	studio timer	$195.00	$99.00
1	Ramsa	WSA70K	new	loudspeaker	$330.00	$99.00
1	ATI	HD100	used	Headphone amp	$199.00	$149.00
2	ATI	LA200-1	new	Dual line amp	$399.00	$288.00
1	ATI	P1000-1	new	Phono pre-amp	$399.00	$349.00
1	ATI	PB2X8	new	Press box	$1,399.00	$1,199.00
1	Sabine	FBX901	demo	Feedback eliminator	$649.95	$449.00
25	Radix	TP500	new	Telephone live mixer	$289.95	$185.00
15	Atlantic	1217	new	cassette wall rack (holds 19)	$25.75	$19.95

MULTI TRACK MD RECORDER

564

Multitrack production with the portability and convenience of the MiniDisc format!

NEW

Features:

- Instantaneous locate capability
- Erase, divide, combine and bounce forward editing
- 4 mono and 4 stereo inputs
- 3 band EQ with sweepable mids
- Record up to 5 "takes" of a given track
- Digital output
- 37 minutes of 4-track recording time per disc
- Jog/data wheel

Mfr. List $1,499.00

Call For BSW Sale Price

DA38 — Digital Multitrack

Features: Hi-8 transport, fully compatible with DA-88s, built-in electronic patchbay, built-in test tone generator, track copy function, programmable track advance and delay, options for digital I/O, remote control, MMC and SMPTE sync.
Mfr. List $3,499.00

Call For BSW Sale Price

M-08 — Compact Mixer

Features: 12 inputs (4 mono 4 stereo), 2 band EQ on all channels, 2 AUX sends per channel, mute and PFL on each input channel, 60mm linear master fader and optional rack ears.
Mfr. List $349.00

Call For BSW Sale Price

CD401MKII — Professional CD Player

Features: balanced analog output • digital out • pitch control • fader start • auto-cue with selectable sensitivity • single & repeat play modes
Mfr. List $1049.00

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TASCAM

Quality Telephone Audio

Telos 100 Delta
Digital Telephone Hybrid

Telos' most advanced hybrid automatically adapts to each call with intelligent digital circuitry to provide the best possible audio for your talk shows etc.

- Smart digital gain control
- Context sensitive output AGC
- Intelligent caller audio equalization
- Digital feedback suppression

Mfr. List $2,180.00
Call For BSW Sale Price

Telos One (Modem Case)
Digital Telephone Hybrid

Telos digital quality in a compact package, now at a new lower price!

- Automatically adapts to each call
- All digital processing
- Built-in AGC
- Mic or line level input
- Advanced downward expander on caller audio

Mfr. List $680.00
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Mini Disc For The Road

Sony MZ-R3
Portable MD Machine

A rugged record/play MD machine you can take anywhere.

- Stereo or mono recording (148 minutes mono)
- 10 second shock resistant memory
- Track mark, move and erase edit functions
- Digital line input
- Stereo headphones and remote controller supplied
- Uses 2 "AA" batteries or optional rechargeable battery
- Supplied AC adaptor

Mfr. List $650.00
BSW Sale Price $529.00

Save $210.00

Sony MZ-B3
Portable MD Machine

A high quality, extremely portable audio note taker. Great for news actualities, interviews, etc.

- Built-in mic and speaker
- Stereo or mono recording (148 minutes mono)
- Automatic date and time function
- Voice activated recording
- High speed playback for quick reviewing
- Supplied remote control
- Uses 3 "AA" batteries or optional rechargeable battery

Mfr. List $899.00
BSW Sale Price $679.00

Save $220.00

Reduced Price

Roland DM800
Digital Audio Workstation

A very compact workstation for serious radio production.

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It's easy with the CDR615:

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- 9-pin parallel interface for external automation
- Optional 34-key wired remote control

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Exceeds your expectations:

- Built-in sample rate converter
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- 20 bit A/D converter
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Monitor Speaker

Popular studio monitor with proven performance record.
- 3-way system with 10" LF driver
- Charcoal grey finish and grill cloth
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Yamaha NS10MS
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World famous nearfield monitor speakers are accurate and affordable.
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- Flat frequency response from 60Hz - 20kHz
- Dimensions: 15'x8 1/2"x7 7/8"

Mfr. List $478.00/pair
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EV Sentry 100A
Monitor Speaker

These industry standard compact monitors are still a top seller.
- 2-way system with an 8" woofer
- Robust, yet efficient components
- Dimensions: 17 1/4"x12"x11 1/16"

BSW Sale Price $650.00/pair

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JBL Control 5
Monitor Speaker

Durable, high quality, multi-purpose monitor is at home in a number of applications.
- 6 1/2" LF driver & 1" dome tweeter
- Rugged polypropylene enclosure
- Wide variety of mounting options
- Dimensions: 15 1/4"x9 7/8"x9"

BSW Sale Price $329.95/pair

Save $142.00!

Symetrix 420
Monitor Amplifier

- 20 watts (RMS) per channel into 8
- Front panel headphone jack and gain controls
- Balanced XLR and unbalanced inputs
- Speaker mute switch
- THD <.01% at full power output

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Hafler P Series
Power Amplifiers

Trusted amps with award winning circuit design and a 5 year warranty
- P1000 55 Watts Per Channel into 8 ohms (includes front panel headphone jack)
- P1500 75 Watts Per Channel into 8 ohms
- P3000 150 Watts Per Channel into 8 ohms

P1000 BSW Sale Price $359.00
P1500 BSW Sale Price $398.00
P3000 BSW Sale Price $489.00

Ashley SRA-120
Power Amplifier

A rugged, single rack space amp featuring low distortion and outstanding circuit protection.
- 45 Watts per channel into 8 ohms
- Front panel volume controls
- Front panel headphone jack

BSW Sale Price $329.00

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AES SHOW PREVIEW

November 8–11 • Los Angeles Convention Center

AES 101st Convention Coming to Los Angeles

by Alan R. Peterson

LOS ANGELES The 101st Annual Audio Engineering Society Convention is a go for Nov. 8-11 at the Los Angeles Convention Center here.

The theme of this year's convention is "Head Out on the Highway," with a variety of workshops, papers, special events and well over 350 exhibitors presenting the latest and greatest in audio technology. The keynote speech will be delivered by futurist John Strawn (see page 28).

The last time the Audio Engineering Society held a convention in Los Angeles was six years ago.

During that period the Los Angeles Convention Center has been renovated and expanded to become one of the better convention venues in the world. After a tumultuous six-year period in the City of Angels, the facility has formed the cornerstone of a revitalized downtown area of first class hotels, office buildings and shopping.

The Center's new South Hall will house the convention. All exhibit space is to be on one floor, with demo rooms, workshops, papers, and special events facilities conveniently located nearby.

The workshop programs stress hands-on and interactive learning opportunities as well as panel discussions and seminars. The workshops begin early on during the convention and the preliminary program includes the following.

Friday, Nov. 8

At 9 a.m., the series of workshops begins with "Microphones and Microphone Techniques," chaired by Keith Seppanen of California State University in Chico, Calif.

This workshop is going to feature a number of experts from the fields of pop/rock recording, classical recording, and sound reinforcement. Seppanen and company will focus on how to make the proper choices when it comes to microphone selection and placement. An exchange of ideas from the attendees is encouraged.

Also at 9 a.m., "Digital Audio Sync Issues" with chairman Steve Davis of Crawford Audio Services in Atlanta.

Low-cost digital equipment has forced the issue of synchronizing digital audio in the everyday world of audio recording. This workshop will explain the principles of digital audio and provide methods to keep ones and zeros in line from beginning to end.

From 2 p.m. to 5 p.m., the next series begins with "Tube Technology."

This workshop explores the role of tube technology in the digital era. Design and practical applications of tube equipment will be addressed.

While this workshop continues, "Audio for DVD" begins just down the hall. Tomlinson Holman from TMH Corporation and USC Cinema-Television in Los Angeles chairs this session, emphasizing the problems of getting audio onto Digital Video Disc.

Discussions include total bit budget, A/V synchronization and several functions new to audio engineers such as branching.

Features embedded in audio bit-rate reduction systems such as audio compression for the home environment, reference levels, and other day-to-day issues will be highlighted.

Of interest to radio broadcasters, this workshop will include discussions and proposals for the forthcoming high-capacity audio-only media.

Saturday, Nov. 9

Weekend workshops begin at 9 a.m. sharp with "Multitrack Digital Recording: From 8 to 48 Track Machines," a session chaired by author/electronic musician Craig Anderton.

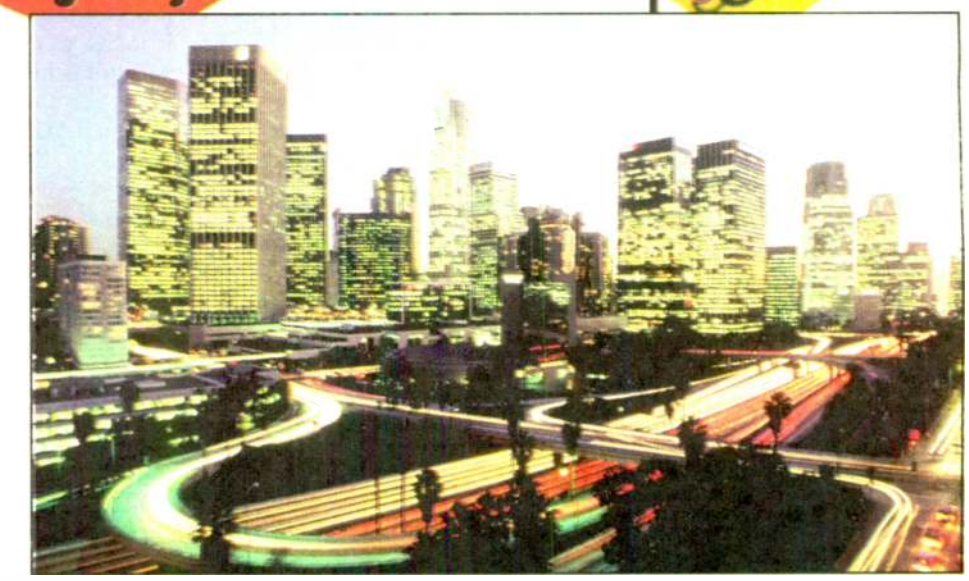
Various digital multitrack recording formats including S-VHS, 8 mm, 48-track Sony, hard disk, etc. will be covered. Members of Anderton's panel will discuss the technology of these formats as well as cost and maintenance issues, analog and digital interfacing, future trends and how to decide the right multitrack digital format for your station's purposes.

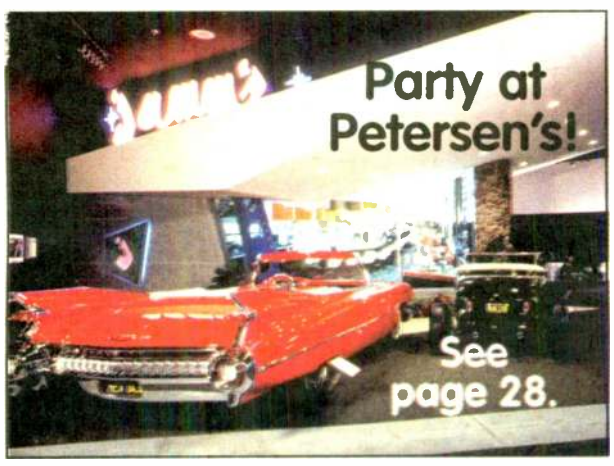
While production directors attend that session, engineers would be wise to sit in on "High Bandwidth High Quality Digital Audio," chaired by Bob Stuart of Meridian Audio Limited in Huntington, Cambridgeshire, England.

The focus of this workshop is the evolution and application of digital audio techniques for very high-quality applications. The workshop will go in several directions, including human psychoacoustic and listening aspects and new applications (including DVD) for high-quality, high-bandwidth techniques.

After a two-hour lunch-break and a walk around the exhibits, it is time to return for the 2 p.m. workshop "A History of Mastering," with Bernie Grundman from Bernie Grundman Mastering in Hollywood.

This will be an extensive overview of mastering from simple beginnings to its present-day status as a distinguished profession. Present and future prospects in mastering will also be discussed.





More DVD technology is discussed in "Software Developers, Users and DVD," with chairman Murray Allen of Electronic Arts in San Mateo, Calif.

This workshop brings together tool developers and end users who author the programs for CD-ROMs. Issues of audio quality versus sample rate conversions, aliasing and quantization, digital artifacts, and more will be considered in a hands-on look at digitized audio.

Sunday, Nov. 10

Enjoy yourself Saturday night, but be ready for the first workshop this morning at 9 a.m. "Audio for the Internet/WWW" is hosted by David Johnson of New Media Designs, Denver, Colo.

Here you will explore the role of audio on the Internet, the latest technologies in real-time transmission and data streaming, as well as technical document publishing and research aids on the Internet and World Wide Web.

Stations merging and considering new studio facilities will find a lot of useful information in "Studio Design for the Project Studio."

Chaired by Russ Berger from the Russ Berger Design Group of Dallas, this workshop will examine three case studies, presented from the perspective of the owner, design team and contractor. Among the finer points of this session, scheduling, budgeting and design criteria will be discussed.

You have another two hours for lunch, until the next series of workshops begin at 2 p.m.

First up, "The CD Manufacturing Process," chaired by David Rabideau of U.S. Optical Disc, Sanford, Maine. This session will stress the importance of equipment and processes necessary to manufacture optical discs, including new technologies and processes unique to DVD manufacture. Also, the continuing debate of double-speed (and higher) versus single-speed glass mastering and the effect it has on the audible program.

"Auditory Perception" also begins at 2 p.m., chaired by Diana Deutsch of the University of California at San Diego.

Topics to be addressed here include the creation of illusory sounds by computer, differences in listener perception of complex sounds, the concept of norms in audio engineering practice, and the use of the World Wide Web in conducting experiments in sound perception.

Monday, Nov. 11

The final day of workshops gets underway at 9 a.m. with "Multichannel Mixing and Monitoring," and Anthony Grimani of Lucasfilm THX, San Rafael, Calif.

Because multichannel formats are becoming widely available to listeners in home environments, this workshop will focus on techniques for program production and monitoring for these new formats.

"Loudspeaker Technology" with Drew Daniels of Sound Path Ltd., North Hills, Calif., runs concurrently.

Here, attendees will have the opportunity to quiz industry leaders on developments in loudspeaker engineering and application. The session includes a "show-and-tell" and an open Q&A exchange about the future direction of speaker products that will be in use.

The final two workshops begin at 2 p.m., and lead off with "Digital Measurement," with chairman Richard Cabot of Audio Precision, Beaverton, Ore.

This workshop will examine digital audio measurement techniques in accordance with the AES-17 standard and examine the differences between measurements on conventional analog devices. New tests proposed for addition to the standard will also be described, including tests for jitter sensitivity and re-dithering accuracy.

Finally, "Audio Sweetening" rounds out the 101st A.E.S. Convention.

Session chairman Richard Sanders of the University of Colorado at Denver, examines the audio sweetening environment, and its many considerations and methodologies beyond normal music recording. The sesion will also discuss audio sweetening synchronization, monitoring, and

Here are the times the Los Angeles Convention Center exhibit hall will be open at the 101st A.E.S. Convention:

Friday, Nov. 8: 12 noon - 6 p.m.
Saturday, Nov. 9: 10 a.m. - 6 p.m.
Sunday, Nov. 10: 10 a.m. - 6 p.m.
Monday, Nov. 11: 10a.m. - 4 p.m.

Shuttle buses will run regularly throughout the convention for the convenience of attendees.

Events and Concert at AES Show

by Alan R. Peterson

LOS ANGELES An extensive roster of Special Events has been announced for the 101st A.E.S. Annual Convention.

Always a popular feature of the conventions, the Special Events Program this year includes an "Afternoon With..." session, an organ recital and special interest sessions on education, the experiences of women in audio and audio in Central and South America. These events are free and open to all badged attendees.

Friday, Nov. 8

"An Afternoon With... Leo Beranek" begins at 2 p.m. and will be moderated by John Eargle of JBL Inc. and JME Consulting Corporation, Los Angeles.

Leo Beranek began his professional career in 1940 as director of the WWII Electro-Acoustic Lab at Harvard and taught for many years at MIT. As an independent acoustician he designed the loudspeaker system for the United Nations General Assembly Building in New York and concert halls and opera houses throughout the world.

He has authored several important texts on acoustics, acoustical measurement, and music and architecture, and is a Gold Medal recipient of both the AES and the ASA. In the tradition of the oral history of audio, this event provides an informal discussion with a true innovator in the industry.

Saturday, Nov. 9

"Focus on Audio Education" starts at 9 a.m. and runs all day. This will be a day of varied activities devoted to students and education in the field of audio.

First is the Student Conclave at 9 a.m., moderated by Roy Pritts, Chairman of the AES Education Committee, University of Colorado at Denver.

This is to be an international gathering of students, student section officers, educators and the AES Education Committee. The session will present and discuss student membership issues, student section activities, internships, publication of student scholarly papers, and other subjects.

The Education Fair commences at noon, where representatives from institutions offering courses, diplomas or degrees in audio provide information on their respective programs. Prospective students will meet and discuss education opportunities with leaders and advisors in the worldwide academic community.

The future of audio technology education needs to be addressed now, which is why the Society created "AES in the Schools; "a ground-breaking program beginning at 2 p.m.

This session will be chaired by Laurel Cash-Jones of CJ Technologies, Burbank, Calif., and Chairman of the AES in the Schools Project.

Last year, the AES Board of Governors approved a special sub-committee to develop a program of support and presentation materials for high school counselors to highlight opportunities in the broad field of audio. This will be the unveiling of this groundbreaking program which is aimed at students who are beginning to consider their career options.

Sunday, Nov. 10

At 9 a.m., Women in Audio begins, featuring moderator Carol Bousquet of Ferrofluidics Corp., Nashua, NH, and chairperson of AES Women in Audio.

This is a panel discussion featuring some of the industry's foremost women recording engineers, producers and artists. The challenges women face in the audio profession will be considered by focusing on the achievements of panel members.

This is followed by a networking luncheon at noon to continue the dialog and broaden the discussion from the morning session. Cost of the luncheon is $10, and tickets will be at the Special Events Desk during registration hours.

At 2 p.m., the National Academy of Recording Arts and Sciences (NARAS) presents the 8th Annual Grammy Recording Forum. This is an interactive event exploring recent technological and artistic developments in the field of recording arts, with a panel of some of the most respected and successful engineers and producers in the music business.

Sunday's special events roster ends with an 8 p.m. Organ Concert featuring Graham Blyth, renowned organist and technical director of Soundcraft.

The recital takes place at the First Congregational Church in Los Angeles, housing one of the largest pipe organs in the United States.

Monday, Nov. 11

The two concluding sessions today concentrate on the issue of Professional Audio in Latin America. Both will be conducted primarily in the Spanish language.

These sessions will be chaired by Elmar Leal, Governor AES, Taller de Arte Sonoro, Caracas, Venezuela.

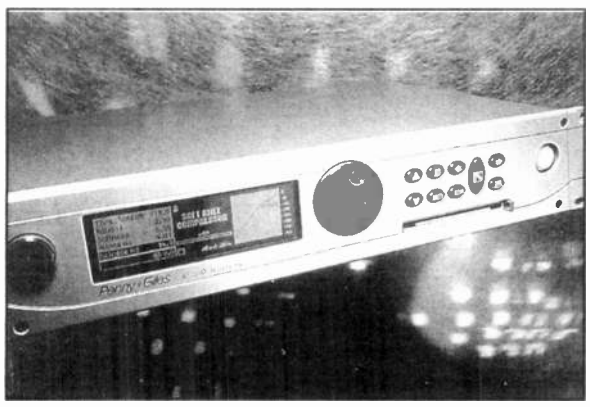
Session One will include several short workshops, including open discussion on studio techniques, digital audio editing, MIDI machine control and comparisons between popular digital interfaces.

Session Two will feature an international panel to discuss the status of the audio industry in each country, audio education, and section activities.

Rolling Out the Best at AES

Here is a listing of companies who will be demonstrating and displaying products at the 101st Annual AES Convention in Los Angeles:

Aardvark
ACME
Acoustic Sciences Corporation
Acoustical Solutions/Alpha Audio
Acoustics
AKAI/International Music Corporation



P&G returns with the PP-10 processor.

AKM Semiconductor
Alesis Corp.
Analog Devices
Antex Electronics
Aphex Systems
Apogee Electronics
ART-Applied Research & Technology
ARX Systems - USA
Athan Corporation
ATM Fly-Ware
Audio Accessories
Audio Exchange International
Audio Matrix Systems
Audio Precision
ATI (Audio Toys Inc.)
Audio-Technica U.S.
Audix Corporation
Aureal Semiconductor
Avalon Design
Bag End Loudspeakers
Baltic Latvian Universal Electronics ("B.L.U.E.")
BEC Technologies
Benchmark Media Systems
BGW Systems
Brainstorm Electronics
Bryston Ltd.
C Audio
CableTek Electronics Ltd.
ASTATIC Microphones
Calrec Audio Ltd.
Carver Professional div. of Phoenix Gold
MASCO Electronics
Cerwin-Vega
Circuits Maximus Co. (CMCI)
Cliff Electronic Components
Coffey Sound
Community Professional Loudspeakers
Countryman Associates
Crest Audio
Crown International
Crystal River Engineering
D.A.S. Audio of America
Dan Dugan Sound Design
Deltron Components
Denon Electronics
Developing Technologies Distributors
Digidesign Division of Avid Technology
Digital Audio Labs
Discrete Research Group
Doremi Labs
Drawmer
DVA
E-mu Systems
East-West
EDnet
Euphonix
Eventide
Fender Electronics
FMRTS - Acoustics + Studio Design
Fostex Corp. of America
Opticom
G PRIME Limited
Garwood Communications
GenelecOY
Gepco International
GML / Overquality Products
Gotham Switzerland
Groove Tubes
H.L. Dalis
Harman Music Group
Harrison by GLW
Hohner Midia
House Ear Institute "H.I.P."
ILIO Entertainments
Innovative Quality Software
Integrated Systems Engineering
Inward Connections
ITW Switches
Jan-Al Innerprizes
Jensen Transformers
Joemeek
Josephson Engineering
K & K International APS
Knightek Software Solutions
KRK Systems
L.J. Phillips Audio
Leitch
Lexicon
Lighthouse Digital Systems/
Lightwave Systems
Liquid Audio
Location Sound Corporation
Mackie Designs
Madah-Com
Mark IV Pro Audio Group
Martin Audio / TGI
Mediaform
Merging Technologies
Metalithic Systems
Micro Technology Unlimited
Miles Technology
Mohawk / CDT
Motorola
Muth Audio Designs
Nagra USA
National Semiconductor
Neumann
Neutrik Amber Instrumentation
Non-Stop Music
Omnimusic
Pacific Microsonics
Panasonic Broadcast &
Television Systems Co.
Penn Fabrication
Philips Components - PKM
Plitron Manufacturing
Pre Sonus Audio Electronics
Prism Media Products
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Quantegy
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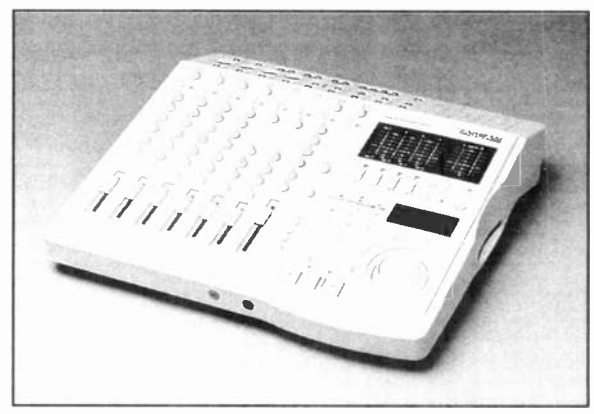
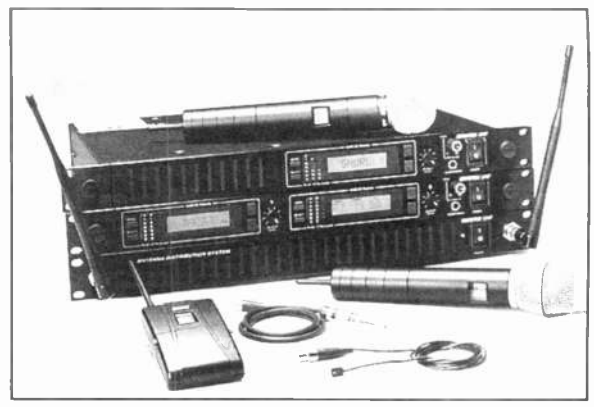
Rane Corporation
Rean Products
Renkus-Heinz
Rocky Mountain Traders
Rolls Corporation
RSP Technologies
Sabine
Samson Technologies Corp.



Tascam debuts its new MD Studio.

Sascom Marketing Group
SCV London
Sellmark/Audiomation
Shep Associates Ltd.
SigTech
Solid State Logic
Sonic Science
Sonopsis
Sound Ideas
Sounderaft U.K.
Soundfield Research
Soundtracs , PLC
Spatializer Audio Labs/Desper Products
Spirit by Soundcraft
Steinberg Soft & Hardware GmbH



Watch for Shure's wireless mics.

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Summit Audio
Switcheraft
Symetrix
Systems Development Group
TASCAM
TAD - Technical Audio Devices
Telecast Fiber Systems
TGI North America
This Town - Desert Island
TOA Electronics, Inc.
Tracer Technologies
Turbosound
Uptown Automation Sys./
Group One, Ltd.
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Calif. Recording Institute.
Wave Distribution
Wenger Corporation
Westlake Audio
White Instruments
XTA Electronics Ltd.
Yamaha Corporation of America
Z-Systems

Head Out on the Highway At Classic Car Shrine

by Alan R. Peterson

LOS ANGELES After a long day in the exhibit hall and a few hours at the workshops, you will have earned your night of fun.

With that in mind, the convention committee for the AES 101st Convention has planned an extraordinary evening at a truly remarkable venue: a party at Los Angeles' Petersen Automotive Museum beginning at 8:30 p.m., Fri., Nov. 8.

The Petersen Automotive Museum, a branch of the Natural History Museum of Los Angeles County, is the largest and most exciting automotive museum in the United States. Located in a 300,000 square foot building originally designed as a department store, the museum is a view into American culture and how the automobile and its design is a mirror of our times.

A variety of street scenes from the past have been created, complete with the sights, sounds, smells and automobiles of the era. Look for a 1920s vintage Richfield gas station, a new car showroom of the '30s and a space-age diner of the '50s to send you back through time.

The AES Party evening will also feature live music featuring legendary blues harmonica player John "Juke" Logan among others, refreshments and an opportunity to mix and mingle with friends and colleagues.

Tickets are available with advance registration or from the Special Events Desk in the registration area. Tickets will not be available at the door.

Strawn to Give Speech

LOS ANGELES Every year, the Audio Engineering Society acknowledges outstanding contributions, excellence in research, scholarship, publication, and other accomplishments that enhance the audio industry.

To this end, the 101st A.E.S. Annual Convention opens with the traditional ceremonies to honor recipients of special awards. Futurist John Strawn will deliver the keynote address.

Strawn may not be a recognizable name to radio broadcasters, but his influence in the field of audio is widely known. It is predicted the work he is doing now on developing technolgies will not readily affect us in the next two to five years, but more likely 10 to 20 years into the future.

Past accomplishments include a Fulbright Scholarship in 1973, a Stanford Ph.D. in 1985, affiliation with The Droid Works (Lucasfilm) and the founding of Yamaha Music Technologies. He has been a consultant through his own company, S Systems, which has included clientele such as Mattel, Atari, Studer/Revox, Shure Bros and others.

Strawn held the Technical Papers chair for the 97th A.E.S. Convention, chaired several papers sessions and governed the Society from 1992-1994.

The keynote address Strawn will deliver is to focus on ways in which today's audio and music industries have been affected by developments in other industries; computers, networks and the treatment of the home computer as the center of home entertainment.

How can the audio industry weather these changes and keep pace with those who create the new technology and thus shape the future? The A.E.S. assures Mr. Strawn's speech will be an interesting glimpse into the future of audio technology.

John Strawn, Ph.D.

Opening ceremonies will commence at 11:30 a.m. on the first day of the convention, Nov. 8, and are open to all attendees.

A reception will follow the keynote address.

— Alan Peterson

Sessions Offer Insights on Technology

LOS ANGELES A number of technical paper sessions are to be presented at the 101st AES Annual Convention. Among those of interest to broadcasters:

Musical Instrument Acoustics/Electronic Music, Fri., Nov. 8, 2 p.m. This session includes a paper on "Simultaneous Noise Reduction and Data Compression in Old Analog Recordings."

Multimedia, Sat., Nov. 9, 9 a.m. A paper on a real-time PC-based MPEG Layer II Codec will be presented.

Networks, Digital Audio and Music, Sat., Nov. 9, 1:30 p.m. "Audio Content Delivery Over Narrow-Band Internet Access" is the topic.

Signal Processing, Sun., Nov. 10, 1:30 p.m. This session includes papers on mic selection with acoustic echo cancellation, old and new techniques for stereo image enhancement and a new balanced audio input circuit design for maximum common-mode rejection performance.

Low Bit-rate Audio Coding, Mon., Nov. 11, 9 a.m. A paper reporting on real-time implementation of an MPEG Layer III encoder for Pentium PCs will be addressed in this session. Also to be presented, the current status of the MPEG-4 development.

Recording and Reproduction Systems, Mon., Nov. 11, 2 p.m. This session will address CD mastering systems and fully-automated control for digital mixers. The entire session is worth staying for.

New Effects for Orban DSE-7000
See page 38

Burning Backup CDs with Ricoh

by Read G. Burgan

LAKE LINDEN, Mich. Until my hard drive size exceeded 200MB, I backed up regularly using floppy diskettes. But when I purchased my first 420MB hard disk, I gave it all up.

Feeding my computer floppies all night was more than I was willing to endure. And I just could not see myself buying a tape drive. I was an accident just waiting to happen.

With the Ricoh 1420C CD Recorder, backing up my hard drive is a snap. And hard drive backups is just one of the many functions this CD recorder does well.

The whole kit

This recorder is manufactured by Ricoh and packaged by Direct Connections. It is an external drive that records at double-speed and plays at quad-speed. The case is 10 x 10 x 2.5 inches, and the kit has a power supply and fan.

Included is a SCSI cable, CD caddie, Incat Easy-CD Pro & MM for Windows 3.1, Easy-CD Pro for Windows 95 and Windows NT and Toast CD-ROM Pro 3 for Macintosh. You supply your own SCSI adapter card. The package sells for $899.

The front panel has three buttons. Two control headphone volume and the other is an eject button. The rear of the unit has an on/off power switch, two SCSI chaining jacks, stereo RCA phono jack outputs and an indicator displaying the unit's SCSI ID.

I had no difficulty installing the unit. After connecting it to my existing SCSI adapter card, I reran the SCSI software so it would detect the new device.

Ricoh 1420C Compact Disc Recorder

The SCSI software loads the necessary drivers. As long as the recorder is assigned a different address than existing SCSI devices on the computer, it boots immediately as a CD-ROM reader and is ready to be used in that capacity.

A disc is loaded into a caddie, then inserted into the recorder until it is pulled in. The unit employs a special double-door structure that, combined with the caddie, virtually eliminates any problems caused by dust.

To use it as a CD recorder, install one of the three supplied software packages for either Windows 3.x, Windows 95/NT or Mac. My test computers were a 486/100 and a Pentium-100, each with 16MB RAM and two 1GB hard drives. I use Windows for Workgroups 3.11 on one machine and Windows 95 on the other.

Incat Systems has made CD recording easy and trouble-free. Select a new file menu and you are given the options of recording a regular CD-ROM, audio CD, an entire disc or other options; including a mixed mode CD that will allow you to make a multimedia CD.

Time has come

I was long overdue for a backup of my hard drives so I chose to make a regular CD-ROM recording.

The software presents a screen where you drag all of the files you want to copy to the CD. When you load the software in Windows 3.x, the program also loads File Manager. Select files as you would when using the File Manager, and then drag them to the Easy-CD Pro menu.

If your files are on more than one drive, drag them in separate operations. The software will tell you the space required for the files and the percentage of space they will occupy on the CD.

Once you are satisfied with the list, select the Record button. On the Windows 3.x version, you can record immediately or do a test run. The Win 95 version automatically runs a test burn. The test simulates the placement of files

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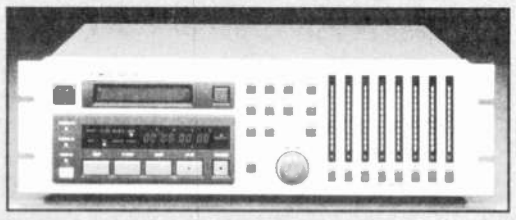
SHORT TAKE

New Tascam DA-38 Recorder Resembles its Big Brother

by Alan R. Peterson

WASHINGTON Tascam released the DA-38 modular digital multitrack (MDM) recorder, a full-featured little brother to the successful DA-88 deck.

Designed primarily for musicians, the DA-38 is ably qualified to handle radio production in personal and project studios and live multitrack situations. Recordings made on the DA-38 are fully compatible and interchangeable with DA-88 MDMs.



Tascam DA-38

The DA-38 provides two industry-standard sampling rates — 44.1 and 48 kHz — and a single 120 Hi-8 videocassette tape allows one hour and 48 minutes of recording time. Some of the newer audio cassettes specifically designed for MDM recorders can hold up to 116 minutes of material.

Frequency response is 20 Hz to 20 kHz with a dynamic range exceeding 92 dB. Analog inputs and outputs are on D-sub 25-pin connectors (+4 dBm balanced) and RCA phono jacks (-10 dBm unbalanced).

A number of features from the DA-88 are available as options for the DA-38. The MMC-38 adds MIDI Machine Control capability to the DA-38, to sychronize the deck with computerized sequencers. The IF-88AE interface brings AES/EBU and SPDIF digial I/O capability to the DA-38, allowing connectivity with DAWs. The IF-88SD interface couples the deck to Digital Audio Stationary Head (DASH) recorders.

Two remote controllers are available for the DA-38. The RC-808 Basic Controller performs all functions for a single DA-38, while the larger RC-848 coordinates the functions of up to six decks.

The Tascam DA-38 is priced at $3,499. For information, use the Tascam Faxback service at (800) 827-2268, then request Document 8900, or circle **Reader Service 166.**

PRODUCT EVALUATION

Audix 1As Are 'Clear' Choice

by Bruce Bartlett

ELKHART, Ind. "Clear" is the word for this little two-way monitor. You can hear everything that's going on.

Over the past 10 years, Audix has developed a range of quality monitors. They are grouped into three types: Mini Monitor Series, Studio Series and Nile Series. Audix suggests these applications for the mid-line Studio Series: home and portable studios, location recording and home audiophile listening.

One model in the Studio Series is the Studio 1A, a compact unit with a simple black box design. It employs a 6.5-inch ported woofer made of polycarbonate and a 1-inch cloth dome tweeter. In the woofer, the frame was designed to be strong and stiff to reduce distortion. The frame is said not to disturb the speaker's magnetic field.

Although the 1A is small, it is surprisingly heavy — evidence of a solid cabinet. Made of a braced wood composition, the box material is said to absorb vibrations and give a tighter, more accurate sound. Natural fiber material inside the box keeps resonances under control.

Grilles are included for shipping, but Audix recommends that you remove them in use. On the back of the cabinet is a pair of 5-way binding posts with polarity clearly marked.

I played a variety of CDs and my master tapes over the Studio 1As. They sounded best to me when placed four feet apart, two-and-a-half feet from the wall behind them, and not toed in. This is what I heard:

- Cymbals and percussion: Crisp, slightly aggressive, airy and extended highs.
- Drums: Clear, very good impact.
- Kick drum: Reasonably deep, with good attack. Deep bass-drum rolls are audible but not weighty.
- Acoustic guitar: Gentle, clear, naturally crisp.
- Electric guitar: Strong edge or bite, not puffy in the midbass.
- Bass: Strong, fairly deep. Not as tight as many other speakers. Deepest bass notes are weak — as you'd expect from a small monitor — but the bass is certainly better than in most other speakers this size. On some recordings, the area from 100 to 150 Hz seems to be emphasized.
- Piano: Very slightly tubby in some recordings, but not in others. Mostly natural with a pointed clarity.
- Sax: Natural. Good balance of fullness and breath.
- Vocals: Natural, a little sibilant.
- Strings: Slightly strident or bright, but detailed.
- My master tapes: The mixes translate well on the Studio 1A, but have slightly brighter cymbals.

MANUFACTURER'S SPECS

Frequency response:
50Hz - 18kHz, ±3 dB
Sensitivity: 87 dB SPL/W/M
Dimensions:
13 x 9 x 10 inches (HWD).
Net weight, each: 18 lbs (8.2 kg)
Power capacity: 50 - 250W.
Nominal impedance: 8 ohms.

The Audix Studio 1A is well-balanced from top to bottom. Bass sounds a bit underdamped at times, but you can reduce this effect by moving the speakers away from the walls.

There is a small rise at extreme high frequencies which could make your mixes sound dull on other speakers. But the bright highs add clarity as you listen to your mixes on the 1A. In fact, that is a good overall description of this speaker. It sounds clear, vivid, and palpable.

Dynamics are very impressive in the Studio 1A. The speaker is quite revealing, so you can hear what each instrument is doing in a complex mix. Imaging is exceptionally fine, both in location and depth. You can easily hear differences in reverb algorithms.

Listening fatigue and distortion are very low, making this a good choice for all-day monitoring of your off-air signal.

Although the Studio 1A is less efficient than many monitors, this should not be a problem if you have a powerful amp. The speakers' tone quality does not change as you move around in front of them.

I feel that the Audix Studio 1A is an especially good value.

List price is $599/pair with a one-year limited warranty. The Audix sales office is at P.O.Box 248, Lake Forest, Calif., 92630.

□□□

Bruce Bartlett is a mic engineer, writer and recording engineer, and the author of "Practical Recording Techniques" published by Howard Sams. He can be reached at (219) 294-8388.

Product Capsule:
Audix Studio 1A Monitors

Thumbs Up	Thumbs Down
✓ Clear, mostly accurate	✓ Slight high-end peak
✓ Low fatigue	✓ Weak deep bass (normal for small speakers)
✓ Good impact and imaging	✓ Bass could be tighter
✓ Strong bass	
✓ Wide dispersion	

For more information, contact Audix at (714) 588-8072 or circle Reader Service 121.

Nobody Does Digital Like Denon

Why trust your CD playback products to anyone but Denon? Denon has been a leader in digital audio technology since 1972 with the introduction of the world's first PCM digital recorder. In 1975, Denon demonstrated the first PCM optical disc player while in 1982, Denon pressed the first commercially available Compact Disc.

Today, Denon offers the Industry's most comprehensive family of professional CD players, CD Jukeboxes and CD-ROM Jukeboxes. From broadcast and post-production to fixed installation and mobile DJ, Denon has the right product for all your Compact Disc playback applications. That's why Denon *is* The First Name In Digital Audio.

DCM-340 5 CD Changer

DN-610F CD/Cassette Combi-Player

DN-2500F Double CD Player

DN-600F Single CD player

DN-650F Single CD Player

DN-1400F 200 CD Changer
DRD-1400 200 CD-ROM Changer

DN-951 FA CD Cart Player
DN-961 FA CD Player

DN-2000F MKII Double CD Player

DENON
The First Name In Digital Audio

Denon Electronics Division of Denon Corporation (USA), 222 New Rd. Parsippany, NJ 07054 (201) 575-7810

Circle (26) On Reader Service Card

Home-cooked Discs

▶ continued from page 29

on the CD track by track without actually recording to the disc.

Preparing the files can take four or more minutes if you will be using the entire disc. The test will take as long a it would normally take to record a disc.

If successful, the program will offer the option of proceeding with an actual recording. At 2X speed, it will take more than 30 minutes to record a full 650MB. If you are recording less than 650MB and want to add to the disc later, it is important not to check the Close Disc option: once the disc has been closed, it cannot be written to again.

I tested two Ricoh units: one with a 512 kB buffer, the other a newer 2MB unit. If the drive feeding the CD recorder is not fast enough to keep the buffer from running out, the recording will abort, ruining the disc. This is a common problem in CD recording.

Running on empty

During the test portion of the recording, the buffer ran out frequently on the 512 kB unit, but not on the 2 Megger. The larger buffer clearly solves the problem of buffer runout.

The alternative is to record at 1X speed and try again. That solves the problem but doubles the record time.

When I actually recorded the backup files, the result was a mirror image CD of the original files on my hard drive. With less than 500MB of files, my recording was completed in under 30 minutes.

For the first time in years I could relax without the worry that all of my computer files could be lost in a single moment. The cost works out to about one cent per MB. Such a bargain!

I do a lot of digital audio recording, usually stored on DAT. I was anxious to see how it would be to record my own audio CD.

There are three ways to record an audio CD using the Incat software. If you have digital audio software, prepare a series of WAV files recorded in 44.1 kHz stereo.

If your files are at some other sample rate or are not in stereo, the Windows 3.x version has a batch converter that transforms WAV files to 44.1 kHz stereo. If you batch-convert several individual soundfiles, it creates one large WAV file containing all of the files, which means a CD with one very long track.

You could break the sound files back down into their individual components using your original digital audio software.

Once you have the 44.1 kHz soundfiles on your hard drive, begin the process by selecting New from the File menu and selecting CD-DA as your format. You will be presented with another drag and drop screen.

The software will tell you how many MB your files will occupy on the CD and how much space is left. Figure 1 is a sample of the Incat CD Pro 95 screen after files have been dragged to it.

Rrearrange the order of the files after they have been dragged to the screen, or delete and add others as you go along. When done, select Record and the software prepares files for recording and runs a test. The process is delightfully simple.

With the 512 kB buffer, the test frequently terminated prematurely with a "buffer underrun" display. Buffer underruns were never a problem with the 2MB unit.

If the test is successfully completed, proceed with the recording. I recorded several audio CDs from WAV files without any problems. The real test would be whether or not they will actually play on a regular audio CD player.

My first CD-R went into my old Toshiba CD audio player to see if it would play. Older CD players have tracking difficulties when reading CD-Rs, apparently because of differences in the reflective dye layer of recordable CDs.

Well, it played almost perfectly. Several times there was a loud snap between cuts. Manuals for both the recording software and Sound Forge 3.0 revealed some CD recording software will do that if you leave certain options checked when you save Sound Forge files.

After unchecking the options, another CD was burned. This time it was a perfect audio CD in every respect. Several more recording sessions confirmed that this was a foolproof way to make audio CDs.

Making a copy

Theoretically, it is possible to copy an entire audio CD using Incat software and the Ricoh 1420C recorder. But to do so requires a SCSI-2 CD-ROM player, and the majority of players sold today are enhanced IDE models. These will not allow copying an entire CD.

If you have a SCSI-2 CD-ROM player, not that only a small portion of SCSI CD players manufactured support this function. The CD player must be capable of digital audio extraction.

But note the Incat software will allow you to use the Ricoh 1420C as a "reader." Insert the CD you wish to record into the Ricoh recorder. Then select the "CD-Recorder" menu and "Disk Info And Tools." This will give you a menu listing of all the audio tracks on the CD. You then select those tracks that you want to copy from the CD.

Now select Read, type in a file name and select Read again. Your file will be written to the hard drive as a WAV file that can be recorded through the normal process.

It is not as fast or as elegant as recording directly from a CD, but it works.

To make later copies of an audio CD, you should first record a regular CD-ROM containing the original 44.1 kHz files you want as the basis of the CD.

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EAS NEWS & VIEWS • EAS NEWS & VIEWS • EAS NEWS & VIEWS • EAS NEWS & VIEWS

EAS News & Views

LATE EDITION

HARRIS ANNOUNCES. . .

BUYBACK PLAN

Due to unprecedented demand, Harris Corporation Broadcast Division has announced a plan to solve buyer's remorse.

Those of you who purchased another brand the first time, may now trade in that unwanted EAS system toward the system you wanted all along, ENDEC by Sage Alerting Systems.

If you are in posession of a free and clear certified EAS (not EBS) system in mostly working condition, we will offer a trade-in of $400 toward a Sage ENDEC system listed at $2395.

Since everything you need is probably already in there, Harris and Sage make ENDEC an easy choice.

Stations not yet in the queue are still able to obtain delivery before the deadline of this January 1. BUT!, orders or requests for trade-ins should be made before November 20.

If you plan to program the unit (FIPS codes, etc.) you'll want a few days of programming time and "dry running". If you want your ENDEC programmed by us, let us know and give us at least 10 days lead time to accomplish programming for you.

Sage ENDEC has been called "the Elegant Solution." It is the one you want and need to meet January 1 compliance. Let us buy back any mistakes and supply you with the EAS unit that passes the tests of performance, ease of use, and value. ENDEC from Sage Alerting and Harris.

"Since everything you need is probably already in there, Harris and Sage make the ENDEC choice an easy choice."

For more information about making the best EAS decision for your station, contact the Harris Broadcast Sales Center today:

1-800-622-0022

FAX: 317-966-0623

http://www.broadcast.harris.com

HARRIS

11th Hour:

Don't let the EAS deadline catch you off guard.

"Ripken's rounding third after belting a long fly ball deep into right field! Here's the throw to the plate — it's going to be a close one! The crowd's on its feet, and the call is...."

"THIS IS A TEST, for the next 60 seconds, this station will conduct a test of the Emergency Broadcast System. This is only a test."

The intrusive two-tone alert signal punctuating Emergency Broadcast System (EBS) announcements has ruined many a ball game over the years. The good news for viewers is that this tired old system has been replaced by a souped-up enhancement that will eventually make the two-tone signal a thing of the past. The bad news for the operators is that, compliance is mandatory and must be on line at all radio stations by this January 1.

EBS is a product of America's "duck and cover" days, designed to create a pipeline over which the president could speak to the public in times of national emergency. By the start of the 90s however, complaints from every corner claimed that the two-tone test signals were a tune-out.

This new EAS system streamlines the process and creates an atmosphere that removes the "cry wolf" syndrome from listener's point of view and significantly reduces the tune-out factor for broadcasters.

The EASy Choice

by
GEORGE L. SOSSON
CEO/PRESIDENT
RADIO EQUITY PARTNERS

Running a group of 19 high performance radio stations is a daily challenge. Deciphering the FCC EAS rules and selecting the appropriate equipment to fulfill the FCC requirements is an even bigger challenge. One of the advantages of running a broadcast group like ours is the many talented resources we have at the station level. I asked our station engineering staff to investigate what Emergency Alert System equipment was available and how we could best satisfy the need of Radio Equity Partners while satisyfing the FCC requirements. At present, there are only two FCC type certified Emergency Alert System encoders/decoders, the TFT 911 and the Sage ENDEC.

We carefully studied them both. My station engineers are a tough bunch to satisfy, and they spent considerable time trying to understand the differences between the available equipment. When it was all over, I concluded that the Sage EAS ENDEC system was the right choice for us.

What were the important requirements of EAS equipment for REP stations? First and foremost, the equipment had to be easy to operate. We have a wide diversity of board operators ranging from superstars doing our shows to part-timers doing the weekend and night shifts. We had to be convinced that every one of them easily could meet the FCC requirements of sending and receiving weekly and monthly tests and relaying emergency messages from the National Weather Serive, local civil authorities or even a national alert from the President of the United States. The Sage 4-button ATM design meets our needs. The competitive unit with more than 47 buttons was just too confusing.

Second, the equipment needed to interface easily with our many and varied studio and transmitter facilities. Sage EAS ENDEC comes standard with six analog inputs and six digital input/outputs, and automatic program line switching for unattended opertation which made it extremely versatile for our stations that are live, computer assisted or totally automated. We wanted to be able to operate in manual EAS mode during most dayparts and automatically switch to unattended operation at night when some of out stations are programmed by satellite or computer. The Sage ENDEC made it easy. The competitive unit required us to buy numerous options to achieve this level of performance.

Sage ENDEC

Third, we had to figure out how to deal with our duopolies and triopolies, understanding that the FCC allows co-owned and co-located stations to use the same EAS equipment. We found that Sage ENDEC, when equipped with its options, remote controls and multiple station relay panel, gave us the ability to operate up to three radio stations from a single ENDEC. In some cases, we decided this was a good idea, and, in other cases, we decided to buy and ENDEC for each station.

Fourth, we wanted to be sure that the product would be serviced and maintained properly in the future. We do not expect to be buying new EAS equipment for another 20+ years. Sage has an arrangement with Harris Broadcast Division to market service and stock the Sage ENDEC family of equipment. We have worked closely with Harris for many years, and we know them to be reliable, credible and responsible folks. This helped our decision as well.

Finally, we need to be sure that we could buy everything we needed for a complete EAS installation from one source. The new EAS rules require that stations monitor two or more sources. We needed additional receivers for monitoring other AM or FM stations or, in some of our markets, VHF and UHF including the National Weather Service, public safety agencies, state emergency management organizations, etc. The Sage multiband modular receiver was just the right unit for our stations. Its modules were well thought out, as was the entire Sage ENDEC design.

It is not easy for non-technical folks like myself to make decisions about something as technical and important as the Emergency Alert System. With the help of my engineers, we were able to home in on the important issues and we decided to standardize with the Sage EAS system. We are expecting delivery shortly and plan to be fully installed and operational way ahead of January 1, 1997, the date the FCC has mandated EAS be ready to roll.

For more information contact Chuck Maines or Gary Hardwick at the Harris Broadcast Sales Center:

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

HARRIS

Give EAS Providers A Pop Quiz.

(Following questions provided by Harris Corporation for your EAS protection)

When you talk to a potential EAS provider, ANY EAS provider, obtain satisfactory answers to these pertinent questions before you buy. . .

- Will the EAS product transmit and receive simultaneously? (so that you don't miss any desired message)
- Will the EAS product protect you and your listeners by NOT bumping one message if another starts coming in? (If a tornado WARNING is in the process of coming in, could it be bumped and lost due to a thunderstorm WATCH that may start coming in on top of the tornado warning in progress??
- Right out of the box, do you have to buy anything else or hook the basic EAS product up to more than your station receivers to make an automated station fully compliant?
- Does the EAS product come standard with less than 6 monitor inputs? 6 bi-directional serial comports? 3 programmable contact closures?
- Does the EAS product come standard with 2 audio inputs for pre-record capability?
- Is the EAS product fully supported by a reputable, reliable, responsible and world-recognized broadcast leader?
- If I require more than two monitoring inputs, will it be necessary to purchase them extra?
- Can I add codes to the encoder and decoder by myself or will that require factory intervention?
- Can I store my own radio in the unit to preannounce the alert?

For the EAS equipment that makes straight A's across-the-board when you put it to the test, call Harris to inquire about Sage ENDEC.

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

HARRIS

EAS Q&A

The 1996 National Association of Broadcasters Convention in Las Vegas gave Harris and Sage an excellent opportunity to show the EAS ENDEC system to many broadcst executives including group chief engineers, group general managers, and program directors. The response to the Sage EAS ENDEC system was extremely gratifying and we believe that they have clearly addressed the concerns of radio and television broadcasters by designing a unit that is easy to operate, flexible in its interface to existing equipment and a unit which will operate reliably for long periods of time. Here are a number of questions that were asked repeatedly by customers like yourself.

Q Do I need a computer or remote control connected to the ENDEC to make it work?

A The answer to both is no. The ENDEC can be easily Configured and Operated from the front panel Soft-Keys.
The included six serial ports are definable for all types of equipment from Computers to Interactive Remote Controls to interfacing with Video Character Generators and LED Signs. It is possible to assign one of these ports to "DOS" and use a Computer to Download, Modify and Upload all parameters of the ENDEC, which could be especially helpful when configuring many ENDECs for a group of stations or just to store your settings on a floppy diskette for backup purposes.

Q Do you have a solution for television broadcasters? Do you support the Chyron CODI™?

A The answer to both questions is a re sounding yes. The Sage ENDEC interfaces directly with the Chyron CODI withou the use of an addition computer or additional computer or software. This makes it very attractive if you already own a Chyron CODI and want ot use it for EAS purposes. If you do not already own a CODI, the Video Data Systems is VDS-840 EAS is the right solution for you. This specially modified unit goes downstream in the video chain and has a "hard relay bypass" to jump the video except when EAS alerts are being transmitted. During alerts, the VDS-840 EAS genlocks to the incoming video and puts a crawl across the upper third of the screen with various colored backgrounds depending on the severity of the alert. The ENDEC can also be programmed to continue this crawl at a specified time interval as long as the message is still valid.

Q We have unattended transmitter sites all over our state public television network. How do we run the monthly tests that come at night if our transmitters are all turned off?

A The FCC rules say that in alternate months, monthly tests will be run either at 6:00 AM to local sunset or local sunset to 6:00 AM. If a station is signed off the air for any reason during the time of a monthly test, they must rebroadcst it soon after signing on. The ENDEC can be programmed to sense if the transmitter is in an on or off condition and if the transmitter is off, the ENDEC will hold the message until predetermined time after transmitter turn on and then automatically send the monthly test.

Q You competitor seems to have a lot of options on his unit. He starts off with a basic low priced unit but by the time you put the option together it costs more than yours. What options are available, if any, on the Sage ENDEC?

A Our design philosophy was to make a complete unit that would serve every radio and television station in virtually every situation. Six analog and six digital inputs are standard as is the two minutes of high quality audio and the digital printer. The ENDEC automatically switches a single stereo or dual mono stations for unattended operation. The only option available is a non-volatile memory storage which can be added in increments of 10 or 40 seconds which would allow broadcasters to store, for instance, their news "sounder" in a permanent audio storage and in the menu, electronically affix it to the front of any EAS message. This permanent audio storage could also be used if you are originating monthly tests and want ot have the entire script stored permanently so the operator need only push a single button to send the monthly test.

Q We have more than one Broadcast Station in our facility. How can we Relay and Originate Alerts for each of them separately without buying an ENDEC for each one?

A The Multi Station Relay Panel and Hand Held Remote Control is your answer. The ENDEC itself has a stereo program interrupt to transmit Alerts. Up to two MSRPs may be added to an ENDEC for a total of four Program Interrupts. When you match each Program Interrupt with it's own Hand Control (RC-1). You can independently Originate and Relay Alerts at different times. Simply assign the appropriate Call Sign to each Station wired to each Interrupt and Hanc Control and a single ENDEC will act like four separate EAS Encoder/Decoders. Conversely, and ENDEC with one MSRP and two RC-1s behaves like three different ENDECs. Every ENDEC comes with six monitoring inputs to receive Alerts. "Illogical", you say. The ENDEC with it's built-in Program Interrupt and two MSRPs equals five Interrupts. The FCC Rules require that a Monthly Test may not be delayed longer than 15 minutes and using all five Interrupts and one ENDEC with a Monthly Test with up to two minutes of Audio would cause the fifth station to be late on it's re-transmission.

Q I have heard that the ENDED is difficult to Configure.

A The ENDEC has many features and capabilities built-in. A participating Station needs only to enter their Local Area to tell the ENDEC where it is in this great country of ours and their Call Sign. Then wire it into their Audio Chain and connect their Primary and Weather Service Receivers. It is possible to modify the Incoming Filter settings that tell the ENDEC how to handle any Alerts it receives other than those required by FCC rules. It is possible to make additional Outgoing Templates to speed the Orgination of all types of Alerts.

The ENDEC by factory default settings will Automatically Relay the EAN (Presidential Alert). Hold the Required Monthly Test that is Originated by Primary Stations and retransmit it when you are ready (within time limits). Log the Required Weekly Test that you receive from your Monitoring assignments and Transmit your Required Weekly Test with the push of two buttons.

Q Is there a quick, easy way to get out of an alert which the station originated or an alert originated by another station? I am worried that if the stations upstream do not send the end of message (EOM) signal we could get hung up.

A The ENDEC features an override/abort mode by simply pushing the two right-hand buttons on the front panel simultaneously at any point. This will take you out of any menu and bring you back to the top of the menu stack or abort any transmission in progress. When this feature is used to abort a transmission, the end of message is automatically sent by the ENDEC so as to not hang up stations who are monitoring your station.

On the remote control, the bottom right hand corner button is boldly marked abort and has the same functions allowing an operator to return to normal operation with a single button keystroke.

For more answers to your questions on EAS or Sage ENDEC, call Harris.

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- ☐ C. Educational AM/FM station
- ☐ E. Network Group Owner
- ☐ F. Recording Studio
- ☐ K. Radio Station Services
- ☐ G. TV Station/Teleprod Facility
- ☐ H. Consultant/Ind Engineer
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Reader Service P22

October 30, 1996 Issue — Use Until January 29, 1997

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005	025	045	065	085	105	125	145	165	185	205	225
006	026	046	066	086	106	126	146	166	186	206	226
007	027	047	067	087	107	127	147	167	187	207	227
008	028	048	068	088	108	128	148	168	188	208	228
009	029	049	069	089	109	129	149	169	189	209	229
010	030	050	070	090	110	130	150	170	190	210	230
011	031	051	071	091	111	131	151	171	191	211	231
012	032	052	072	092	112	132	152	172	192	212	232
013	033	053	073	093	113	133	153	173	193	213	233
014	034	054	074	094	114	134	154	174	194	214	234
015	035	055	075	095	115	135	155	175	195	215	
016	036	056	076	096	116	136	156	176	196	216	
017	037	057	077	097	117	137	157	177	197	217	
018	038	058	078	098	118	138	158	178	198	218	
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Ricoh CD Recorder

▶ continued from page 32

You will no longer have to keep the files on your hard drive. To make additional copies at a later date, create a playlist using the WAV files on your CD-ROM.

Now you can use your computer's CD-ROM player as a source. Any CD-ROM player should work — IDE or SCSI — as long as it can play the files as fast as your CD recorder can lay them down. I had no difficulty using this technique with my NEC quad changer.

You can record more than one session on a compact disc, but cannot play it on a regular CD player unless you've "closed" the disc. Remember, a closed disc means you cannot record any additional information onto it.

Advantages

I do digital restoration of 16-inch transcriptions of old radio programs, generally as 22 kHz mono files. The original material has little frequency content above 10 kHz, and processing time and storage space are greatly reduced at 22 kHz.

Until now I have had to store them on DAT tape at 44.1 or 48 kHz, meaning about two hours on one DAT at an average cost of $4 per hour.

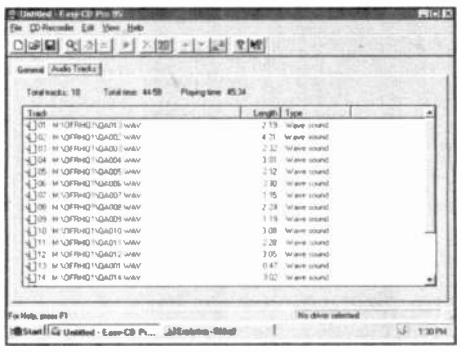

Fig. 1: Incat CD Screen

I could record in the LP mode on DAT, but that meant 32 kHz at 12 bits resolution. I much prefer keeping the resolution at 16 bits and the sampling rate at 22 kHz.

Now I can store the files in their original 22 kHz WAV format and fit four hours of material on one CD-ROM. That works out to less than $2 per hour, with an archival life span of 100 years or more for a CD-ROM. Compare this to DAT's projected life of 10 to 15 years.

I plan to copy all of my program files to a CD-ROM, then run them directly off the CD. The NEC 4 disc changer on my computer lets me have up to four discs active at any one time.

That opens more than 400MB on my hard drive, leaving it almost all free for active user files. It is like adding an additional 650 megabyte hard drive for eight or nine dollars.

In the event of a head crash or when the time comes to replace the hard drive, all I will have to do is copy Windows 95 to the hard drive and I will be ready to go again.

I have one criticism of the 2MB buffer unit. Four times it terminated a recording test with a message the blank CD was defective. Another disc solved the problem, but the "defective" discs recorded perfectly in the 512 kB buffer recorder.

Two were Phillips CDs provided by Direct Connections, and two were Sonys I purchased myself. Direct Connections is testing the unit but does not have an explanation for this phenomenon yet. A rejection rate approaching 50 percent is troubling, particularly when the same discs work in a similar machine.

The Ricoh 1420C is rated as a quad speed player. Benchmarked against my NEC quad changer, it transferred data at about half the rate of the NEC. It may be a 4X reader, but is at the lower end of the quad range.

Naturally, nobody buys a CD recorder for its reading speed. But think twice before you get this unit as your sole CD-ROM player. The Ricoh frequently drops frames when playing multimedia clips.

The Incat CD Pro software manual is scanty at best, but on-line help more than makes up for this. Adaptec's website also contains several helpful FAQs on its Incat CD Software.

Happy hunting

One unrelated problem: there is a nationwide shortage of blank CD discs. Numerous discount computer outlets told me they had none.

One said they had back orders for well over a thousand blank CDs, and I should place my order now, only to wait several weeks for my turn. I eventually found enough to test the units.

Sources say the shortage will ease by the end of the year and prices will drop. If predications hold, discs should be down to about five bucks by around December.

Direct Connections has put together an attractive package. The Ricoh 1420C with a 2MB buffer provides solid performance and virtually guarantees you won't ruin CDs because of the buffer.

Incat's software is intuitive and makes CD recording trouble-free. The external unit does not take up any drive space in my computer and the fan in the CD recorder enclosure ensures the unit will not overheat.

For further information, contact Direct Connections, 7668 Executive Dr., Eden Prairie, Minn., 55344. Telephone (800) 572-4305 or (612) 937-6283. The company can also be reached at *www.directdc.com* on the Internet.

□□□

Read Burgan is a free lance writer and former public radio station manager who can be reached at (906) 296-0652 or through e-mail at rgb@up.net

PRODUCER'S FILE

DSE FX and EQ: How's That Again?

by Ty Ford

BALTIMORE Now that the Orban DSE-7000FX and Version 6.0 have officially been released, I am allowed to talk about them. I brought a DSE-7000 in and have been happily using it ever since.

Yes, I am a DSE-7000 beta test site and I am very thankful for the extensive alpha testing done by the DSE developers. Due to their efforts, though there have been a few interesting wrinkles, there has yet to be a disaster.

Version 6.0 brings in a few new operational and editing tweaks; like easy loop playing for running that series of dubs to quarter-inch analog while you lunch, keystrokes for switching from Normal to Digital Bounce recording and menu navigation, increased metering showing submixer levels and the effect processing has on master output levels. The on-screen "track on" indicators are nice too.

Stop the presses

The real news, however, is the arrival of the 24-bit DSP FX Engine that provides parametric EQ, reverb, delays, a gated compressor/limiter and +12 dB of gain that works across each of the eight tracks, the new internal submixer and the main stereo output bus. Too bad it's not adjustable.

Added to the DSE-7000 formidable time compression algorithm, the whole package comprises a powerful suite of on-board effects that truly make the DSE-7000FX a "Studio In A Box."

If your DSE-7000 is one of the very early ones like mine, with a 386-20 motherboard and EGA or VGA display, you will need to upgrade to a 486 board, SVGA monitor and card and the new FX card. Fortunately, only a few DSE-7000 users have machines old enough to require that upgrade.

If you purchased a system after June 1996, your system already has the FX board, and — like all DSE software upgrades — the 6.0 software upgrade is free.

DSP development

Development for the FX started about a year ago in response to requests for EQ, reverb and delay processing.

According to Product Manager Geoff Steadman, that required a lot of paperwork, prototyping and code work to ensure the new software would be compatible with all of the DSE-7000s in the field.

One of the first hurdles was porting over the extremely powerful time compression algorithm of the DSE-7000. It made the trip and now runs three times faster.

"We could have done it on the old card, but not with the full real time control the users were used to," said Steadman. "The architecture is also designed to be able to support future DSP processes. So we can now do a lot of DSP work with software."

The standard FX system has eight DSP "slices" that, for example, allow you to run a different EQ on every track. A standard mono EQ uses one slice, stereo EQ uses two. There are a number of presets for each of the EQ, compressor and reverb programs and each is also user adjustable. User modified programs can be saved as a custom preset within a production, but not as handily as some systems that have a library of settings.

To recall programs on the DSE automatically, you need to make them part of a production with no audio to save opening time, then open a copy of it each time you start a new production.

Need more processing? The optional Turbo System uses a daughter card with 24 slices.

The Lexicon connection

Orban parent company, Harman, also owns Lexicon. This means having Bob Orban's designs for the digital EQ and compressors and Lexicon reverb algorithms for the DSE-7000.

These consist of simple and more complex multitap reverb designs. Simpler reverbs use two slices and the Lexicon stereo reverbs use three. Note that if you patch the Lexicon reverb into a track, it will be mono unless you patch it into the new stereo submix section and fold it back through the input faders.

The individual track patch points (1-8) are pre-pan and pre-fader. You can patch any single effect into any of the eight tracks or link 1-2, 3-4, 5-6 and/or 7-8 together in pairs for matched dual or stereo effects.

You can set up a digital internal effects submix, sending different amounts of each of the eight tracks to an effect and returning it via the L/R input faders. There is also an insert point across the main stereo output bus for final processing. If you want some 'verb in the cans, but do not want to commit until the mix, you can insert reverb there just for monitoring, knowing that it is not being recorded.

Hitting Shift & Solo on the control surface mutes all effects, or, if you're working on one particular patch, it will mute just that effect.

Learning the keystroke shortcuts really speeds things up. Instead of cursoring around the menu for the effects patchbay, you can hit Go To & Set, and go right to the Effects Patch Bay screen.

continued on next page ▶

New Effects for the DSE-7000

That window also shows you how many processors are being used and how many are available. Pressing Escape takes you back to where you came from.

Oo-wee GUI!

Orban has greatly extended the capabilities of the DSE-7000 by coming up with new uses for the existing array of buttons and faders on its controller panel.

In the EQ section, for example, the 10 faders become frequency, level and Q controls for the variable low- and high-pass filter and two bands of full-parametric EQ.

The Low Shelf covers 10-500 Hz, +12/-36 dB. The Low Mid is 30 to 300 Hz, +12/-36 dB with a Q of .2 to 5.0.

Upper Mid is 500 Hz to 14 kHz, +12/-36 dB with a Q of .2 to 5.0, and the High Shelf is 1 to 15 kHz +12/-36 dB. These are nicely chosen values, chosen for where most of the real EQ work often needs to be done.

There are twelve EQ presets including a simple fixed-frequency four-band EQ for anyone adventuresome enough to find it, but not experienced enough for a full parametric. You can choose any of them as a starting place for your own curves.

I found a +2.1 dB lift at 7.4 kHz with a broad .20 Q provided a lift from 15 kHz down to 3 kHz, with a drift from there down to 50 Hz at the 0 line. It worked very nicely for adding a bit a presence to a close-worked UM70 Gefell.

There is even a very nice dynamic display that shows the changing shape of the EQ curve you are creating. Unlike some systems that require lengthy screen redraws, the DSE-7000FX display follows your changes in less than half a second.

An Over light comes on to warn you when too much additive EQ has pushed the stage into distortion and a "parameter out of range" message warns you when a number of moderate adjustments or a single radical adjustment may have pushed the DSP engines beyond their capacities.

Obviously, asking for a 12 dB boost above 15 kHz when a project has a 32 kHz sample rate is a good way to summon the message. Being able to make adjustments and hear the changes in real time while you see the curve change in realtime is exceptionally cool.

Compressor

The compressor is full-featured, with on-screen gain reduction meter and adjustments for input sensitivity, release time, ratio, knee corner, gate threshold, gate target output, gate release, and makeup gain with a gate status light.

There are 15 different presets of varying severity with voice and music titles to suggest their usage. I am really starting to dislike overly compressed audio so the "Voice Medium" setting for a voiceover music mix was best for me. The presets get a lot more aggressive and, of course you can dial in your own.

The mini-reverb offers adjustments for; wet/dry mix, inSrc Gain, reverb time, HF reverb time, initial diffuse, reflect density, reverb attack and another Over light. There are seven mini-reverb presets; Vocal Thickeners 1 and 2, P.A. Vocal, Subway Intercom, Foyer, Stairwell and Lecture Hall.

The small and large "deluxe" Lexicon 'verbs (there are 17 small and 15 large) provide control for mix, bandwidth, reverb time, LF reverb time, HF reverb time, initial diffuse, reflect diffuse, reverb attack, early echoes, late level controls and an Over light.

Coal in my stocking

I will probably be dropped from their holiday card list for observing the following. While Orban has been ingenious in repurposing the controls, I would much prefer a small side-bucket of knobs to mess with the effects. I find switching between fader uses distracting when trying to adjust the effects or in using the submixer.

Fortunately, they have created a "split mode" that allows the track faders to remain connected to the eight tracks of audio while the monitor input faders act as submix returns to the master out.

Other convenient changes include a new use of the Solo button. It now toggles between two different effects settings, allowing you to compare sounds. Undo, which normally "undoes" your last audio edit or record function, doubles in the effects mode to restore the original settings for an effect.

The most important thing that Orban has achieved with the DSE-7000FX is providing an effects package that advanced users can appreciate, while keeping the system simple enough to be used by the average air-staffer. Having accomplished this, and interfacing the DSE-7000 with ENCO and BE hard drive systems for on-air use, the challenges of SMPTE, mix automation and multimedia audio file export may, or may not, be on a list somewhere.

If I told you what I know, I would have to kill both of us.

□□□

For information on the DSP FX engine, contact Orban at (510) 351-3500.

Ty Ford is a regular contributor to RW and the author of "Advanced Audio Production Techniques," available from Focal Press. Reach him at tford@jagunet.com

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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.

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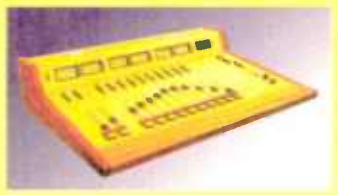

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As illustrated in the Sony Worldwide Networks master control studio on the right (one of seven Arrakis studios in the Manhattan, New York complex), Arrakis can provide complete major market studios with Arrakis consoles, digital workstations, video-audio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

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Manhattan, New York

Circle (611) On Reader Service Card

ATC: From Israel to Washington

by Rich Rarey

PUBLIC DOMAIN

TEL AVIV, Israel The two contenders for the highest office in the land were locked, neck and neck, in a dead heat for the favor of the people. One candidate, in his early seventies, was considered "too old" by his detractors, although he had served his country well for decades.

The other, the challenger, was a handsome younger man with silver hair. He was considered "too slick" and "artificial" by his opponents. The two had criss-crossed the country with their advisors and security men, giving stump speeches and meeting the public.

Our assignment was to discover what the people thought of the candidates, and what, in their mind, were the important issues facing the country. Our team was to travel around the country and record the voices of the people, and transmit selected material back to NPR in Washington.

It sounds like a familiar routine election year assignment, except that the country-in-question was Israel, and the candidates for Prime Minister were Shimon Peres and Binyamin "Bibi" Netanyahu. This election was significant because it was the first time Israeli citizens could directly elect their Prime Minister.

The gig suddenly became a lot more interesting.

In initial discussions with producer Art Silverman and host Robert Siegel, I found the plan was to conduct many interviews with a handful of Israeli citizens, who were living in all points of the country, and record their voices and sounds on DAT.

Later, in our hotel, we would clone the appropriate interview sections and ambient sound we gathered onto another DAT. This DAT would become our master feed reel. After the sound and interviews were cloned, we would record Siegel's voice narrative ("the trax") onto the master feed DAT. We planned to transmit the master DAT material to NPR Washington using a Switched 56 circuit located in NPR reporter Eric Weiner's Jerusalem apartment.

By recording on DAT and sending only raw, unmixed material back to NPR, we realized a great economy of baggage; we did not have to ship mixers, equalizers, monitors, boxes of analog tape and editing equipment. Better and more elaborate mixes could be created in an NPR Washington control room than in our hotel room. The final equipment complement fit neatly into two Anvil cases.

In addition to the recording duties, we were to broadcast live to "All Things Considered" on election night, May 29.

Baggage check

The flight to Tel Aviv, Israel, was uneventful. The security personnel rigorously searched all passengers and hand-searched all luggage during the Frankfurt, Germany layover.

I am always apprehensive about having recording equipment inspected electronically. I fear what the amount of radiation might do to magnetic heads and sensitive electronic components.

This time, our equipment was inspected by being lightly dusted, then vacuumed into sensitive analyzing apparatus. The apparatus recognizes any dangerous substance, but its analysis didn't affect our equipment in any way — much superior to the X-ray method and safer for all travelers too.

Every remote assignment is, to me, a new challenge. It always seems that the first day of recording is spent perfecting how one carries the varied recording equipment, and once perfected, it becomes an easy matter to slip the pocketed vest on each morning and get right to work.

This line of PortaBrace brand vests has plenty of pockets. A Sony D-10 DAT recorder fits into the front zipper section, the power cable snaking around the back of the vest into the pocket containing the Panasonic LCR12V6.5 battery.

These batteries — nicknamed "Butcher Batteries" for NPR shop engineer Bob Butcher — are relatively heavy, but afford eight hours of continuous operation on one charge and really make DAT field recording practical.

A Sonosax SX-M2 Mic Preamplifier supplied phantom power for the two Neumann KMR-81 microphones, and provided very high quality preamplification into the D-10.

Both KMR-81 mics were housed in Zeppelins, with one Zeppelin attached to a "fish-pole" to easily bring the mic up close to our interview subjects. Host Siegel held the other mic.

Tape is rolling

We recorded the interview subjects on the left DAT channel, and Siegel on the right channel. While the vest held the

continued on page 52 ▶

Lindy Williams
V.P. Engineering
Lotus Communications
Los Angeles, California
"We've replaced some 'very expensive' condenser microphones with the RE27N/D ...now the GM wants the guest mic replaced, as well as the production studio and the newsroom microphones. You're blowing my engineering budget!"

Steve Lariviere
Chief Engineer
WSNE
East Providence, Rhode Island
"We replaced six expensive German condenser microphones in favor of the RE27N/D. What a great sound!"

Marv Collins
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Los Angeles, California
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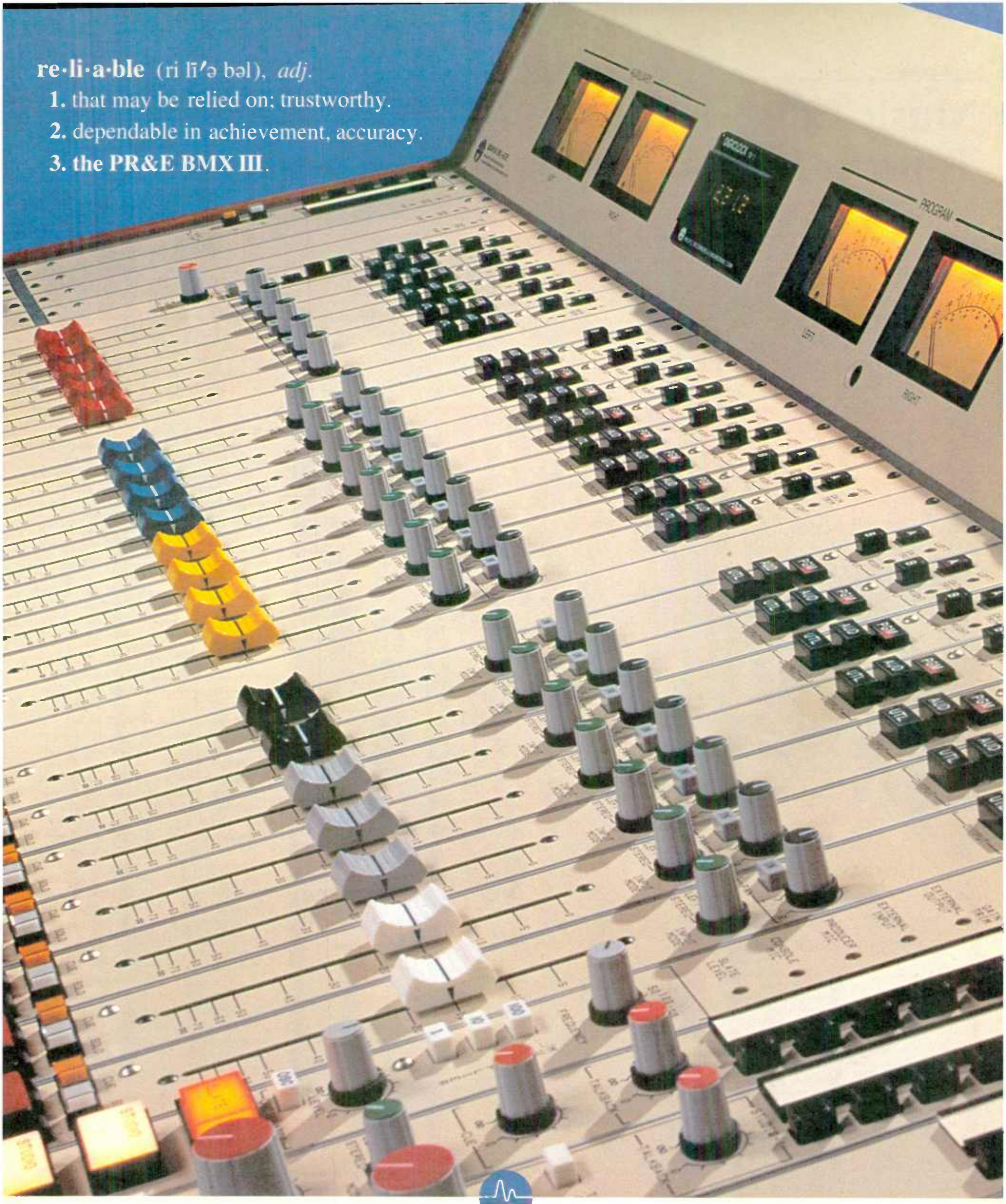
re·li·a·ble (ri lī′ə bəl), *adj.*

1. that may be relied on; trustworthy.

2. dependable in achievement, accuracy.

3. the PR&E BMX III.



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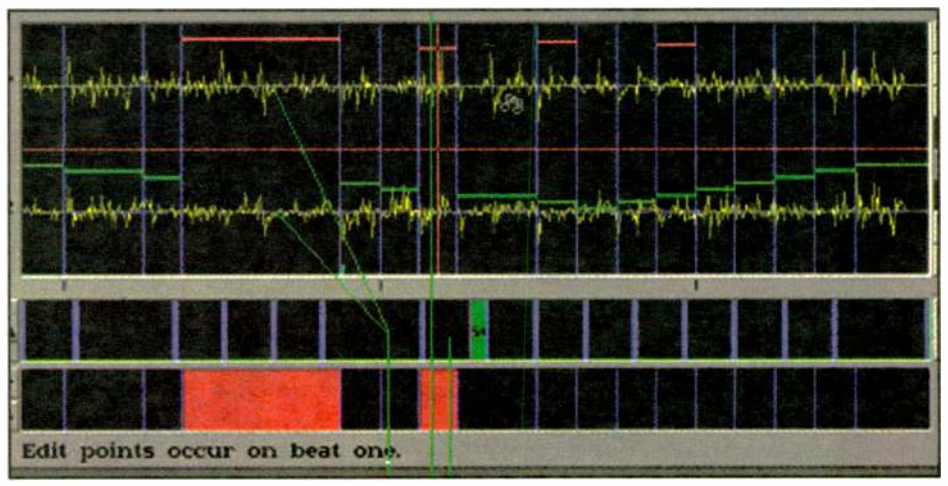
Circle (29) On Reader Service Card

Music Editing with TuneBuilder Software

by Ed LaComb



The TuneBuilder Window: Where the Magic Happens

SYRACUSE, N.Y. The really neat thing about computers in the production room is that the only limitations are software and your own creativity. In either case the sky is the limit these days, but for this review, I'll stick to the software side of that equation.

In the old days of production, if you needed to lengthen or shorten a music bed, you either did a blade job on a two-track or a quickie digital loop on your workstation. Now, voila, along comes the RW "Cool Stuff" award-winning TuneBuilder from AirWorks Media.

This neat little program lets you pick a music piece from their library of beds and then decide how long or short you want it. A quick click of a button and a few short rendering seconds later, you have your music bed with the exact time your looking for. Or as AirWorks says in their promo materials, "3:13 to :29 in 1 second."

If you are using a digital system, you can save your new version in your choice of several different soundfile versions and then import it directly into your digital production session file.

So now, it seems there is one less skill you will need in the production room: digital editing of music beds. Now if only that computer could have the coffee waiting for you when you arrive.

How to get rolling

To begin with, TuneBuilder can run on either a PC with a soundcard (minimum 386) or a Macintosh, using its built-in sound capability. You also need a CD-ROM drive. A quick warning here though: be sure the sound card in your PC is supported by this software. The first PC I tried to install the program on had a Galaxy soundcard and it did not work. A quick call to tech support detected that problem, so I instead moved onto the Mac version for my actual review.

TuneBuilder works in two basic parts: there is the software, and there are the music beds on CD.

AirWorks Media has several libraries that you can choose from, ranging from corporate/industrial to thematic beds. Even the classic Valentino library has been converted for TuneBuilder use. For this article, I used the Arpeggio Library which gave a good overall feel for the system.

When you first fire up the program, you are in the Library Window; one of four main windows. Here you can search the list of available musical selections on CDs designed to work with TuneBuilder.

You can search by style, tempo and even beats per minute. Once you select your music cut — or cuts — you can then proceed to the Project Builder Window which is where you "store" your selected cuts. You can even store your newly created cuts here for later use or export.

I think of the Project Builder Window as my "regions bin," if you are used to digital terminology. The main window of TuneBuilder is appropriately named the TuneBuilder Window. This is where the actual magic of TuneBuilder takes place. Without getting too terribly technical, read how the system works.

No grunt work

Each music bed is laid out in front of you with the edit points already determined by the software gurus at AirWorks. When you specify a certain length, the software looks at each individual section, measures its length and then calculates the best combination of regions to tack together which will get you to the overall length you want.

The regions are seamlessly separated on the beat so when they reassemble in whatever order, they sound great. So what happens if you don't like the way the computer chooses to assemble certain parts? No problem: you can tell it to try another configuration. If you still don't

continued on page 49 ▶

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- ☐ G. TV Station/Teleprod Facility
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Reader Service P23

October 30, 1996 Issue — Use Until January 29, 1997

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004	024	044	064	084	104	124	144	164	184	204	224
005	025	045	065	085	105	125	145	165	185	205	225
006	026	046	066	086	106	126	146	166	186	206	226
007	027	047	067	087	107	127	147	167	187	207	227
008	028	048	068	088	108	128	148	168	188	208	228
009	029	049	069	089	109	129	149	169	189	209	229
010	030	050	070	090	110	130	150	170	190	210	230
011	031	051	071	091	111	131	151	171	191	211	231
012	032	052	072	092	112	132	152	172	192	212	232
013	033	053	073	093	113	133	153	173	193	213	233
014	034	054	074	094	114	134	154	174	194	214	234
015	035	055	075	095	115	135	155	175	195	215	
016	036	056	076	096	116	136	156	176	196	216	
017	037	057	077	097	117	137	157	177	197	217	
018	038	058	078	098	118	138	158	178	198	218	
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EAS Case Studies

The FCC's deadline for mandatory EAS compliance is rapidly approaching. Many broadcasters are beginning to feel the heat— especially since the FCC continues to maintain there will be no extension beyond the deadline.

Since the scramble for equipment began several months ago, many broadcasters have asked how the Sage ENDEC can address their special problems.

CASE 1 Our area's LP1 (primary EAS station) and an LP2 (the backup) have different philosophies on alerts. The LP1, an all-news station, carries all important watches and warnings from the National Weather Service and local authorities. The LP2, a music station, carries the most severe warnings. If the LP1 is off air, the LP2 will carry warnings the LP1 would carry. Can ENDEC accomplish this automatically?

Yes, if the LP2 has ENDEC's Modular Receiver. The receiver has outputs to indicate the presence of both the carrier and modulation on the station being monitored. If ENDEC's manual override is set to the LP2/LP1 function, the following happens: As long as the LP1 is on the air with modulation, the LP2 carries only the alerts it has agreed to run. If the LP1 goes off the air or loses modulation, ENDEC senses the condition and switches the profile of the LP2 to the LP1. This enables the LP2 act as a full backup to the LP1, carrying all significant warnings and alerts.

CASE 2 A triopoly (three stations in the same facility) has an automated news and talk program on AM and two live music programs on FM. How can one ENDEC and the relay panel get appropriate alerts on the AM first, without delay, then allow the two FMs to run the alerts at an appropriate time?

By using ENDEC and a two-station relay panel, the unit can independently switch the audio of three radio stations. The first station is directly into the ENDEC and the second two stations are on the relay panel. By programming the profile of each station separately, ENDEC can be commanded to automatically put the appropriate alert on the AM immediately upon receipt, and then allow the two FMs to preset which will carry the alert next. This ensures that the alert will get on the AM immediately and fit into the programming of the two FM music stations during appropriate commercial breaks.

CASE 3 A totally automated FM music station wants to carry appropriate EAS alerts for its area but doesn't want to constantly cut into its music format to put the alerts on the air. Can ENDEC do this?

Yes. With ENDEC's commercial tally function, it's a snap. The ENDEC has a number of programmable relay functions that allow closures, latching closures, and pulse closures at every stage of an incoming or outgoing alert. In the case of this automation system, a relay is programmed so that it closes in an appropriate sequence when a valid incoming message is stored in the ENDEC. This tells the station's automation system to make the next event the emergency message stored in the ENDEC. The automation system sends back a relay closure or voltage to the ENDEC, holding off transmission of the alert until the next event is ready. At that time, the ENDEC automatically interrupts the program line, sends the alert, then returns control to the automation. The result is perfect program continuity in a totally unattended automated station with the alert getting on as quickly as possible.

CASE 4 An AM news and talk station has four studios, any one of which could be on the air at any time. How do you control the ENDEC in the manual or timed relay mode from all of these locations if the ENDEC is mounted in the control room rack near the STL?

ENDEC can support up to five full-featured remote controls simultaneously, allowing access to all of ENDEC's functions from up to five independent locations. In this case, the ENDEC was installed in the engineering space about 150 feet away from each of the four studios. Each studio is equipped with a remote control that is mounted on the side of the console where the operator can easily read the 8-character display and activate all the buttons. Once one of the studios has seized control of the ENDEC to send or relay the alert, other users purposefully are locked out until those functions are completed. At this time, all of the stations can again control the ENDEC. The remote control makes it possible to push a single button to listen to the message stored in ENDEC, to send weekly and monthly tests, and to put an alert on the air immediately. With the remote control, you also can store dozens of area-specific messages— one to a button— on the programmable keypad.

CASE 5 The National Weather Service in our area sends a lot of watches and warnings on the NOAA Weather Radio System. Our station is the news and talk authority of the town. We pride ourselves on keeping the public up to date on all important events. However, the announcer at the National Weather Service is just awful. His pronunciation and diction sound awful on the air. How can we take these messages, get them on the air, but replace the audio with our own announcer?

ENDEC makes it easy to replace audio on an incoming stored message. Once the message is received, the operator can read the text on the printout or the display screen. The operator can also listen to the audio and make notes about the alert. By connecting a non-program output of the console (cue or audition) to ENDEC's encoder, it is possible to replace audio in storage with audio from a local announcer yet still retain the digital codes and end of message sent by the Weather Service.

If you are using the remote control, you simply hit the record button and send audio from the console to the ENDEC via the encoder in connection. This will replace the audio stored in the ENDEC, even if lengths of the original message and your replacement message are different. When you re-send the alert, the digital data will be exactly what was sent by the National Weather Service, but the voice will be your announcer doing the alert in a clear and concise manner.

CASE 6 Our TV station has three newsroom areas and a master control. All areas need to know about incoming alerts and warnings. However, since we only control ENDEC from master control, we don't need remote controls in newsroom areas. How can we get information out to all these locations?

ENDEC supports up to five multicolored LED signs that crawl the text of incoming and outgoing messages as long as the alert is valid. Designated colors give news crews and operators information about a message's urgency: Green indicates tests; orange is used for watches, and red indicates warnings. Signs can even be made to beep when a message arrives! Signs come in many sizes, and are ideal for radio stations as well as TV stations.

If you have special EAS case that you need addressed, call Harris today.

EAS Installation

Sage ENDEC Installation is EAS-Y

For any configurations you need to provide some basic information to your ENDEC.

Power up your new ENDEC, it will perform a self-test routine and provide the menu screen. Install the printer paper, program your call sign or group name, location and time zone information, per the "Quick Start" section in the manual. Your ENDEC is now capable of basic operation.

For a Single Radio Station:

You will need the Sage ENDEC and receivers to meet your level of involvement in your State EAS Plan. (Two sources, minimum) The Sage RM-3 receiver frame provides 1 AM, 1 FM and 1 NWS receiver in a double shielded, very selective, 1 rack unit package.

Set your receivers for your monitoring requirements, hook the receiver audio to the ENDEC Monitor Audio Inputs, plug your program audio through the built-in Program Interrupt, Set Levels and you are done with the physical installation.

The programming to the ENDEC's Incoming Message Filters and the locally originated Outgoing Message Templates comes next.

For basic EAS compliance, you must Auto-forward any National Level messages, relay the Required Monthly Test within 15 minutes of receipt and initiate a Required Weekly Test in the weeks that a Monthly Test is not scheduled.

The Incoming Message Filters are configured at the Menu Selection "Presets". These Filters allow you to be in complete control of how your ENDEC functions during alerts. On a file by file basis, you will prioritize any incoming alerts and tell the ENDEC how to handle them.

If you plan to locally originate any alerts you may configure Outgoing Message Templates. The "Presets", "Outgoing" Menu selection prompts you to enter all the necessary information for your Operational Area. With these Outgoing Message Templates in place, it is simple to originate an alert. The operator will pick the appropriate Template, assign an event duration time and place the alert On-the-Air.

Outgoing Message Preset Templates allow your operators to quickly and accurately originate any local emergency alerts.

With the Filter and template programming complete, your ENDEC is operational. Let's look at some ways the Sage ENDEC may be implemented to satisfy multi-station requirements.

For two (or more) stations at one location, simulcast;

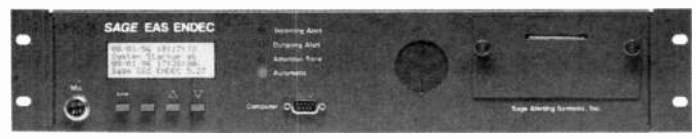
Program and setup the ENDEC as described for a single station application. Then connect a contact closure from the ENDECs' rear panel (Encoder Active Relay) to your stations simulcast switch control, causing the ENDECs output to drive both stations. Need a different audio level for the second station? Not a problem! The ENDEC provides an additional alert audio output on the rear terminal strip.

For two (or more) stations a t one location, independent control;

Use multiple ENDECs. You may distribute the receivers audio to the individual stations. Then program the ENDEC in each station for that stations own requirements. This is moderately more expensive (for a two station application) than the next scenario, but provides absolute independent control and redundancy.

For two (or more) stations at one location, independent control;

Program and connect the ENDEC as before for one station, then add the Sage RP-2 Multistation Relay Panel for two additional stereo program interrupts. (or one stereo, and two mono interrupts) Add Sage RC-1 remote controls in the air studios of stations 2,3, & 4, to provide independent control of the ENDEC. With the MSRP (multi station relay panel) option enabled from the Menu, you may now program Incoming Message Filters for stations 2,3 &4 to custom tailor the ENDEC operation for each station in the group. Each additional stations programming is identified by its' own call sign, so it is easy to verifiy each stations operation on the printed record.



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For an independent viewpoint read the SBE EAS committee report titled "EAS equipment operational characteristics" in the 7/24/96 issue or look it up on their web site at http://www.sbe.org.

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Production Tool from Airworks

▶ continued from page 44

like what you get, you can do it manually, but then you are back to doing it the old-fashioned way.

I have to say that while I was playing with TuneBuilder, there was only one instance when I was not happy with the bed that it created. I asked for a new version, which then sounded fine.

Once you have a bed you like, TuneBuilder will export it in nine different soundfile formats: AIFF, AIFF-C, Sun Audio File, Raw Sample Data, DEC Sound File, Adlib Gold Sample, NeXT Sound File, Creative Voice File and WAV (Microsoft RIFF). Chances are very good there is a format you can use.

The export quality is 16-bit stereo at 44.1 kHz. In any case, you can specify the export sound quality from the Export Sound Window.

I like TuneBuilder for its ease of use, but its appetite for hard drive space is quite large. TuneBuilder says you should have a minimum of 18 MB of drive space, but I say if you really want to make good use of the program, you should plan to double that figure as a minimum.

Even though the music beds are on CDs, you still have to transfer the audio from the CD to your hard drive for any and all selections you want to work on. The CDs simply act as storage sources for the music cuts. All the work happens on the drive.

Note the hardware limitations that TuneBuilder has for PC folks. Matthew Fessenden, product developer with AirWorks says a SCSI drive is "an absolute necessity" in order to run TuneBuilder on a PC. IDE drives are not the way to go here. If you want to run TuneBuilder on the PC platform, you have to have SCSI.

Also, Airworks has been working with the SoundBlaster folks to assure complete compatibility with their sound card line. PC owners may occasionally get a card from another manufacturer that "guarantees SB compatibility," but often does not.

You really need to check your system versus what Airworks supports. If you have a Mac, you are in good shape because it's already configured for SCSI and is pretty much plug-and-play.

Hardware issues aside, if you are a producer of any kind (especially multimedia projects), I recommend TuneBuilder to you. It is really the easiest way to get great-sounding, custom-length music beds without the hassle of locating edit points for yourself and doing the work. The music library I used was a pretty good quality set of tunes and, at last look, TuneBuilder already works with 13 libaries. With any luck, AirWorks should plan on future releases of music to keep the program useful for years to come.

Airworks is at 1 Thornton Court, Suite 700, Edmonton, Alberta, Canada, T5J 2E7.

For information on Tunebuilder, contact AirWorks at (403) 424-9922 or on the Internet at www.airworks.com

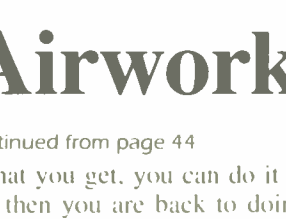
Ed LaComb is assistant program director of WWHT-FM and director of creative services for NewCity Production Services, Syracuse, N.Y. He can be reached at edlacomb@aol.com

67 Years Ago

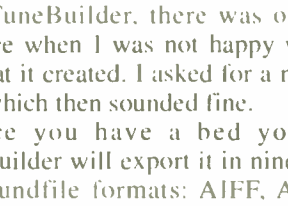
Reprinted from Radio World (November 23, 1929).
Editor's note: The RW of old, printed for a time in the 1920s and 1930s and today's RW are unrelated except in name.

MICROPHONE LIGHTERS

for cigars or cigarettes, with button switch at top. Press the switch and light up!



Model A lighter, microphone design, with 5-ft. AC cable and plug. Works on 110 volts, AC any frequency and on direct current. .....Price $1.00



Model B lighter, microphone design, on tray, with 5-ft AC cable and plug. Works on 110 volt AC, any frequency, and on direct current. Exactly the same lighter as the other, only tray is added. Price.....$1.50

This lighter is instantaneous. Hold button down only long enough to light a cigar or cigarette. The two models are furnished in attractive sprayed finish. Both are very compact! For instance, the tray is only 4½" in diameter. Use these lighters in your home and for holiday gifts.

The heater element is renewable.

Note: The hazards of smoking are well-documented, but the Studio Sessions editor further warns against the use of microphone lighters in the studio for recording purposes. You might burn the tip of your nose.

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Avoid That Ripped-off Feeling

by Alan R. Peterson

WASHINGTON Contrary to popular belief, radio's biggest gut-wrencher is not being fired. It's when you find out you have been ripped off.

When you are new, ripoffs are easier to handle. Neophyte jocks enjoy the feeling of "Wow! Modulatin' Mark over at K-101 just used my joke from yesterday. He listens to my show for ideas!"

Enjoy it now. Years later it will be, "Hey! Modulatin' Mark just stole my bit from yesterday's show. What a creep!"

But of course, you stole it yourself from DJ MC Poppin' Fresh at Hot 108.

For ages, I had little respect for folks who demanded commercial audio that directly ripped off somebody else's work. Strangely enough for me, this includes vocal-zapping; a favorite hobby of mine.

When used in parody, the process is "overlooked." But when popular songs have new lyrics overlayed to produce a commercial, payments to the composer and publisher are due. If I thought ASCAP paid a finder's fee for these violations, I could have retired at 35.

My own worst ripoff episode stemmed from a potential rip-off committed by a station I used to work for. It happened in my past but it irks me even now.

Still raw

An account executive came back from New England with an aircheck. The cassette included several, well-produced, in-your-face spots.

I was to duplicate the spots element-for element with her client's name, and lift whatever I could directly from the off-air tape to accomplish this. That did not sit well with me.

So I called the station and left a voice-mail for the production director, asking him about his tricks. I planned to recreate them without stealing his work outright and asked him to call me back. He did two days later.

He described his great distortion effect (bouncing a cut between tape machines as many as ten times), his killer compression trick (two compressors in series) and an incredible laugh track (the last production guy left behind an outtake of maniacal laughter).

I thanked him and noted what a decent guy he was to share his techniques.

The following week, the salesperson came in to tell me my voice was on a nightclub commercial running in New England. A friend living there heard me give my name.

The guy I thought was a class act turned cheeselog on me. He pulled my phonecall off his voicemail and stuck it in his new spot.

Thanks a bunch

My memory of the commercial is a bit hazy, but my phone message, "Hi, this is Alan Peterson, I'm calling from a radio station in (city) and I'd like to ask you how you did some of your effects," was now followed by, "Ha, I guess that's why you're stuck there in (city)!"

I was not amused. Braodcasting the recorded contents of a phone conversation was bad judgement and completely illegal.

Trouble was, what could I do? I could have called the station, but what assurance would I have that they would pull the spot? I was almost 400 miles away and would never know.

I was in no position to fly to the city in question and file suit. The most I could have hoped for was a cease-and-desist, and by then the damage would be done. Factoring in lawyer cost, plane fare et al, it became more hopeless.

Yeah, I thought about dropping a note to the Commission at license renewal time, too.

The amount of ifs and buts involved were enough to make it an ineffective campaign for me to mount.

All I know is, my voice was illegally on the air in a major Northeast city and I sounded like a moron. At least I can derive some satisfaction by giving away three of this clown's secrets here.

Ever hear about people winning local ad awards based on spots they stole from other markets? When that same spot moves on to regional competition, Lassie, send for help!

Publications like the RAB collections are filled with effective commercial copy and are always winners. There are broadcast pubs that encourage you to adopt their scripts. With these great resources, why must it be necessary to say, "Here, take this spot. Cut out their name and splice ours in?"

Hard work really is often well-rewarded. A demo filled with innovative, clever material will score more points than reviving "Where's the Beef." And my reels have contained both.

If your ambitions include becoming well-known for production, forget ripoffs and find your own voice. Ask "how did you do that?," but then move on. This way you won't get "stuck there in (city)."

Any day now, you are going to be shocked to hear your own hard work callously ripped off. Think about that before raiding your phone mail.

From Israel to Washington

▶ continued from page 42

immediate-use equipment, we carried backup DATs, batteries and mics in the car.

Our portable recording setup thus established, it was easy to tend to the task of recording all interviews. Carefully placing the Zeppelin to the subjects' lips gave the best sound while overpowering any extraneous ambiance.

This technique became difficult when we interviewed an Arab-Israeli family of nine in the port city of Acre. There, it was more convenient to stand and swing the mic on the fish pole to whomever was speaking.

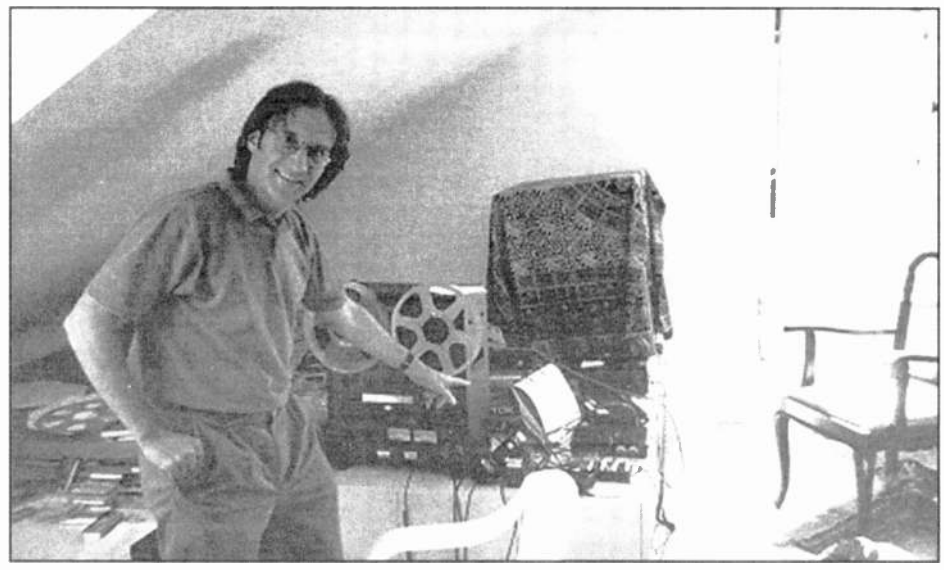
We have found that most people will politely wait a moment for the microphone to reach them. This technique works well for all but the most contentious interview situations where many people are impassioned and want to speak simultaneously.

We found all we interviewed to be hospitable and friendly, inviting us into their homes for the interview and offering refreshment afterward.

Man with a plan

As with the first day of recording, we had to develop a work strategy to log and clone the interview tape to the master feed DAT. By using the recorded time-of-day on the Sony D-10, producer Art Silverman could quickly take notes during the interview and note tape locations by simply consulting his wristwatch.

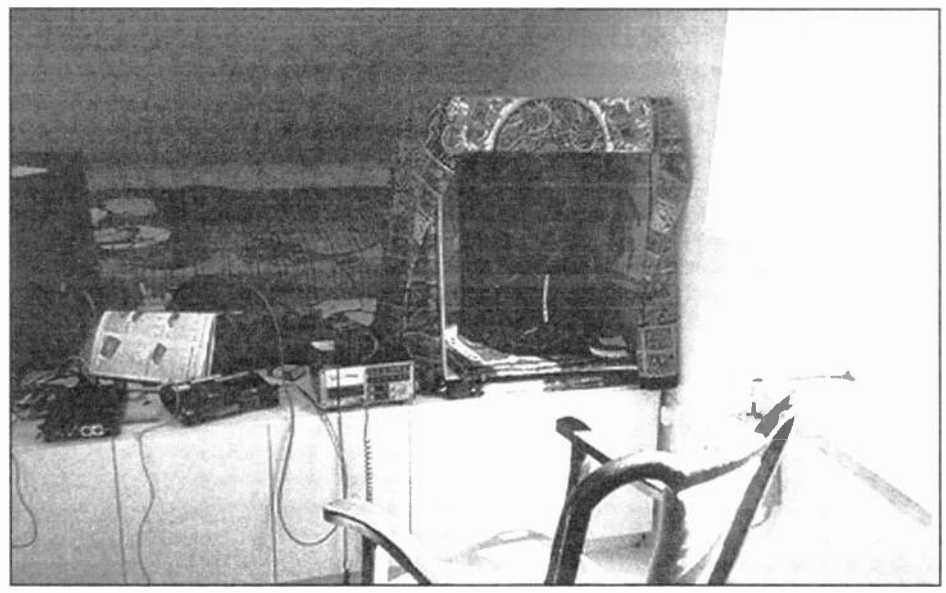
Back in the hotel, I connected the source D-10 to the destination D-10 with digital I/O cables. In addition, I ran both source analog channels through a Shure FP-31 mixer and the mixer output into the destination DAT analog inputs.



Producer Art Silverman at the NPR Jerusalem Filing Center

Because DAT recording on a D-10 is inherently "split-track", I had to pass the audio through the mixer when we occasionally needed Seigel's question to an interview subject. By playing with the mixer's gain structure, I found a combination of level settings that matched the digital clone level and gave the best signal-to-noise.

If Siegel's voice was not required for a particular clip, we simply cloned that section to the master feed DAT. The changeover was as simple as flipping the destination DAT's input switch.



The "Announce Booth" Used by Robert Siegel

Time is on our side

Israel is seven hours ahead of Washington, and this made our deadlines seem wonderfully late. We needed to deliver material to NPR by, say, 8 p.m. Israel time for it to make air at 4 p.m. Eastern time.

I set up my hotel room as the "trax" studio. By wrapping the room's heavy curtains around an upholstered chair, like an orchestra shell, I was able to block out most room echo.

Robert worked the microphone very, very closely, which overpowered any remaining room tone. However this required extreme care to avoid plosives and mouth noise.

Once we completed the master feed DAT, it was a simple matter to feed it down on a Switched56 circuit to Washington. The quality of digital recording with the Sonosax micpreamps made the MUSICAM encoding sound great.

The material was recorded to analog in Washington, split into its parts, and mixed into a piece for that evening's All Things Considered broadcast.

Our last task was to broadcast live on election night. I listened carefully to the room acoustics at reporter Weiner's feed location, and decided the vaulted ceiling and open loft of the apartment ruled out working inside. However, the apartment had a small outdoor patio on the main floor we could use.

I set up a mini-studio outside by running a mic cable and headphone extension cord out the loft window to the patio. The acoustics were quite good, and the outdoor setting enhanced the liveness. NPR Washington provided a backfeed to us, and we went live throughout the feeds of All Things Considered.

It is a matter of record now, but Binyamin Netanyahu narrowly won the election by only 1.1 percent of the votes.

It was a pleasure to visit Israel at such an exciting time, and be warmly treated by its people. It was a pleasure, too, to have worked quickly and efficiently on our material, and be able to "hear the big picture" without being bogged down in mixing details.

Rich Rarey is technical director of NPR's "All Things Considered," and the author of RW's "Public Domain" series. He can be reached at rrarey@npr.org

Running Radio

Your Resource for Business, Programming & Sales

Do the Big Band Jump. See page 57.

Industry Eyes Internet Audio

by Paul J. McLane

WASHINGTON The release of a new audio streaming technology by Progressive Networks and Dolby Laboratories, and the entry of Telos Systems into the streaming marketplace, raise larger questions about the impact of Internet audio on broadcasters and suppliers.

As reported in **RW** on Oct. 16, promoters say RealAudio 3.0 from Progressive Networks allows broadcast-quality programs and spots to be distributed in real time to radio stations anywhere in the world via the Internet. It permits stereo sound over 28.8 kbps modems, and near CD-quality transmissions over ISDN and LAN bandwidths.

RealAudio 3.0 is in beta stage and is expected to be available by the end of the year.

The transport of quality audio is big business in radio. Spot delivery services, codec manufacturers and distributors have thrived on it over the past several years. How will improved Internet audio affect them and their clients?

Many people have "a gloom and doom reaction" to this kind of announcement, said Jim Woods, director of studio products for the Broadcast Division of Harris Corp., which sells equipment to users.

"My basic reaction is: great. Anything that expands our customers' business and helps them distribute quality audio is good for them and us."

Woods said RealAudio has been a good consumer technology and, at first glance, the makers did a good job at making a new broadcast tool, too.

"If it works and does everything they say it does," it could be an important step, he said.

Woods said the receiver side is cheap and easy; the streamer side is where the expense for broadcasters comes in, and where the user must compare the Internet to today's point-to-point codec systems.

"I've seen some that cost four or five thousand dollars," he said. So "I don't think it's bad news for the major codec manufacturers. ... Technologies today can perform better on dial-up phone lines" for a similar investment. He cited the A.E.T.A. Scoop Reporter codec, sold by Harris, as an example. A pair costs approximately $8,000.

RealAudio server software ranges in price from $4,000 to $8,000, depending on the number of simultaneous streams. But proponents point out that radio stations may not need to buy the streaming software. An Internet Service Provider could foot the expense as part of what it provides to the radio station or other user in its service package. Of course, that cost could be passed along to the station in the form of higher charges.

Telos in the arena

The impact of these Internet developments will vary, observers say, depending on whether the application is for mass distribution "netcasts" or for point-to-point delivery, and in the case of the latter, whether audio must be delivered in real time.

Telos Systems, a manufacturer of codecs, is embarking on a streaming system of its own that will compete with RealAudio (see related story, page 11). Telos managers are watching developments with more than passing interest. President Steve Church said RealAudio is indeed improving.

"I've heard 3.0. It's better (than its predecessors) by a country mile. They've moved forward to compression that is similar globally to the MPEG stuff, the perceptual coding.

"I don't think the Internet stuff will replace codecs for the next five years (in cases where) real time transmission is important, because the Net is not sufficiently reliable, and also because of the delay," he said.

"You have buffers in the network and in the user's computer. It's OK for webcasts but less so for interactive applications. For non-real time users — spot distribution — it'll have an impact," Church said.

"The Web is a best-efforts system. It does not guarantee delivery unless you're willing to wait for seconds at a time. It's bursty. It gets through what it can. At anytime, you can suffer from delays and packet loss. With ISDN you have the circuit, no question. It's a 'nailed up' connection. ATM technology may change this, but it's not here yet as a backbone technology."

The Internet is "getting bogged down now," Woods of Harris Corp. said. "The bandwidth is finite, even though there is a lot of it. If every radio station in the country starts pumping audio down it, it could be unreliable."

Church alluded to impatience that users

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Bringing Back Live Performances on the Air

by Frank Beacham

NEW YORK Citing a crisis in arts education in America's schools, the New York Philharmonic will resume live radio broadcasts in January 1997 in an effort to introduce classical music to a new generation of listeners.

After an eight-year absence from the airwaves, the Philharmonic, under the sponsorship of Time Warner, will broadcast five live concerts in 1997. The concerts will be produced by WQXR-FM, New York, and syndicated nationally to radio stations by WCLV/Seaway Productions, Cleveland.

Kurt Masur directs Philharmonic.

With the new series, the Philharmonic is to become the only symphony orchestra to broadcast its performances live on a national scale, and on a regular basis, in the United States. The Philharmonic will present complete, live concerts — rather than tape-delayed performances — resuming the historic broadcasts that for many years carried the sounds of symphonic music into the living rooms of millions across the United States.

The orchestra's ties with radio extend back to the infancy of the medium. In 1922, the New York Philharmonic became the first American orchestra to broadcast performances live on radio. In 1930, it became the first orchestra to do a live coast-to-coast broadcast. In November 1943, it was a live radio broadcast that seized the nation's attention and catapulted a young assistant conductor, Leonard Bernstein, to international stardom.

The 1997 broadcasts are an attempt to revive the excitement of those earlier live concerts. "A whole generation still has the feeling that they learned to love music on the radio," said Kurt Masur, the Philharmonic's music director. "This I would like to recall again."

Masur noted how effective Bernstein, his predecessor, had been in educating young people when he gave his famed introductions to concerts on CBS-TV and later PBS beginning in the late 1950s. "I believe a good music teacher in the schools can use tapes of these concerts to teach," said Masur. "They can do in their time what Bernstein did in giving instructions to the concerts."

In an effort to underscore the Bernstein legacy, the broadcast concerts will be introduced from the audience by Jamie Bernstein Thomas, daughter of the late maestro. "Usually when you hear a live broadcast on the

continued on page 58 ▶

Technology in Progress: Internet Audio

▶ continued from page 53

of ISDN codecs have with even a little digital noise or breakup on real-time feeds. These users, he suggested, won't tolerate the delays and unreliability of the Internet for live work. The Internet, he said, is "no good" for broadcast remotes.

"(The) 'net audio is still in a 'crystal radio' phase, RealAudio 3.0 notwithstanding. The quality at 14.4 is awful, at 28.8 not quite as good as AM despite (RealAudio's) pronouncements, and at ISDN speeds, approaching FM broadcast, not CD, quality. But Internet delivery at ISDN speeds is not yet a mass vehicle for audio. The average 'net listener doesn't have this kind of connection, and the 'net backbone cannot reliably support this quality level," Church said.

Executives at codec manufacturer Comrex Corp. are also "watching with fascination" the growth of Internet audio applications, said Lynn Distler, vice president of sales and marketing. "But there's a marked difference between the reality and the hype concerning this technology.

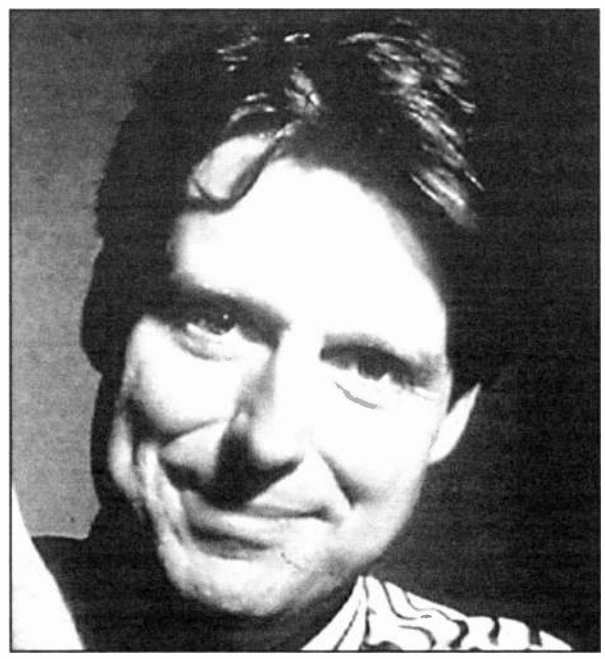
"The Internet certainly provides a new medium for delivery services, but not necessarily using RealAudio or other real-time, streaming software," she stated. "Since real-time is often not a requirement for spot delivery, traditional non-real-time (and higher quality) coding can make more sense. This certainly has benefit in terms of cost and convenience," she said.

"This is not true for remote broadcasting, however. It's like adding a whole new level of complexity and cost, while decreasing reliability, for marginal gain. As things stand now, anyone who has experienced Web surfing knows enough not to trust a remote broadcast to it."

Distler also raised concerns about security and control of any remote link a station might wish to set up via the Internet. But for broader audio distribution, Distler is intrigued by the possibilities, wondering aloud about what Internet audio might mean in the future for the satellite audio distribution business.

Church predicts an impact on digital spot delivery providers.

"Just as the Web is replacing proprietary Internet interfaces, such as CompuServe and AOL, the Web front end (for audio distribution) is compelling. I suspect the guys in spot distribution will be challenged pretty heavily" by the Internet.



Steve Church of Telos Systems

Delivery providers react

Audio distribution provider DG Systems recently proclaimed that it has reached 5,000 stations in its digital distribution network (see **RW**, Oct. 16). The system relies on ISDN and POTS lines to distribute audio. Spokesman Jeff Byrne did not appear threatened by current Internet audio capabilities.

"According to our engineering team here, for a consumer who just wants to preview an audio track — whether it's a new single or just part of the audio content of a Web site — (RealAudio) is acceptable, but you are sacrificing a good bit of the quality and the performance that you could get by using a system like ours," he said.

"Stations we talked to seemed to prefer to have this box (the DGS receiver) rather than own their own server, and risk the vagaries the Internet can introduce," Byrne said. They "seemed more concerned about the congestion issue; if 10 million people are accessing a Web page a month, you are going to incur significant time delays. If that spot needs to be previewed and scheduled for airplay within hours, well, that's a big one."

Stations, he said, prefer a "push" model, in which spots are sent to them, rather than having to call a server and "pull" an audio feed from it.

"Stations really seem to like that. To implement a 'push' model, you can't just have a PC sitting there. You really need a system available 100 percent of the time, 24 hours a day, seven days a week. The advertisers much prefer the 'push' model as well, because they have a much greater assurance of having the right spot played in the right rotation," Byrne said.

DGS does send spots over the Internet, but purely as a transmission vehicle, he said.

"In instances where the Internet is available as the most cost-effective transmission means for us, we are actually using it right now to transmit spots. But those spots do not go onto a Web page; they go onto our hardware platform. And again it is a 'push' model, which is really the biggest distinction between what RealAudio streaming technology is designed to provide."

Internet advocates like Peter Newman, general manager of KING-FM in Seattle, say advertisers could put their commercials on a server and make them available to stations via the Internet within minutes. But reliability and security are obstacles for many observers, including Remy Kozak, vice president of marketing for Digital Courier (DCI), another audio distribution service.

"There's a lot more to delivering advertising material than simply streaming audio: related information, such as traffic instructions, the buy information, and securing the audio — because I don't think an advertiser would want their ads generally accessible (to) their competitors," he said. Kozak also pointed to reports of problems getting on the Internet or obtaining the audio in a timely way.

"You have to pay for the ISDN lines on a monthly basis to get the audio. This is something DCI covers themselves," Kozak said.

The industry is watching

Broadcasters certainly are taking note of the potential of the Internet as a delivery medium. Hundreds have put up Web sites, many are "netcasting," and their managers are pondering how the Internet will affect their business. The general press have noticed, too. A recent New York Times article, "Remaking Radio as Internet Voice," suggested that some industry executives are betting that the Internet will help radio reinvent itself and solve some of its shortcomings. The article focused on Audionet, which carries broadcasts of 85 stations, a jukebox of current music releases and unusual audio events.

Technology from companies like Progressive Networks, Xing and Macromedia are allowing computer users to hear broadcasts and other audio from around the globe, today. The appeal of listening to a home-town football game, of doing a quick market check of stations in a distant city, or of eavesdropping to a Maltese radio signal from your family room is powerful. And U.S. radio stations would no doubt find quality, reliable Internet audio distribution attractive.

The Internet serves broadcasters in other ways. For example, news professionals are beginning to use File Transfer Protocol (FTP) to move audio around the world (see **RW**, Oct. 2, page 21).

Still, broadcasters have many doubts. Edward O. Fritts, president of the National Association of Broadcasters, told RW earlier this month that "as long as somebody's tied to a telephone line or a cable line ... (radio on the Net) probably will never be as good as listening to an over-the-air radio station in the market area. ... And if quality means that much, as some are saying, then I have to think that the Internet quality has to go a quantum leap before it's really acceptable to the ... population."

Also, many of the quality issues raised by audio over the Internet, at least regarding netcasting, will be moot until most computer users are tapping in at better than 14.4, or even 28.8, kbps. Audio quality is limited if the quality of the "first and last mile" is limited.

Reservations notwithstanding, the industry is watching the Internet audio phenomenon carefully. Echoing reactions from other observers, Kozak said, "It's definitely something we have to take into account in our general strategy."

Steve Church said it "will not replace broadcasting, but it is a fundamentally new medium which is exciting for a lot of people ... That is why so many are willing to overlook the present limitations and problems."

Alan R. Peterson and T. Carter Ross contributed to this story.

Get That Generator Installed Now

by Brian Holmes

TAMPA, Fla. In the past four years, the state of North Carolina has been stricken by many disasters-four hurricanes, four ice storms, two flash floods and one major tornado outbreak. Radio operators in the state, especially those on the coast, have had to take the crash course in keeping their stations' on the air.

"Every radio station needs a Plan A, B, and C," says Hannah Dawson-Gage, general manager of Wilmington, North Carolina's WGNI(FM) and WMNX(FM). "Whatever you think won't happen...will"

Gage's stations are the ratings leaders in the market and are also the CPC-1 stations which adds to the importance of keeping the stations fully operational during disasters. Gage and her crew went through a dry run, so to speak, with Hurricane Bertha this year which prepared them much better for Hurricane Fran when it also passed through her town.

"Stations obviously need a backup generator and a backup transmitter if at possible," Gage recommends. "Also make sure you know where to get another generator in advance in case the one you have doesn't work." If this sounds like being too prepared, it's not. Even though Gage had her generator serviced regularly, when they went to use it during Hurricane Bertha, it didn't work properly. The staff had to manually hold the clutch.

Dan Deason, general manager of Wilmington's WSFM(FM) and WKXB (FM) echoes Gage, "A generator is something you obviously need. You may only use it once, but that one time could be the difference in serving the public."

Deason says it's necessary that stations buy a generator for both the studio and transmitter sites. One of the most important things to remember when buying one is how much it can handle. Deason said you not only need to power transmission equipment but also air conditioning. Also make sure the unit has automatic test panels on it that will start and run about 10 minutes each week.

Once you purchase your generator, you won't use it that often. But service it regularly to make sure it works when you need it. "At the beginning of hurricane season, we have a factory representative come out and check them , change the oil and go over it with a fine-tooth comb because what we don't want is a $15,000 investment that quits when we need it. After the storm, we have the factory rep back to look it over again," Deason said.

He also recommends configuring the generator to automatically switch on when you lose utility power. "If you don't do that, you're sending your engineer out into the storm and that's a life in jeopardy. It's only going to cost a little more to have it done right." Deason uses UPS systems to keep his stations running until he can get everything converted over to generator power.

Over at WGNI & WMNX, Gage has always moved to back up power "at the first blink of a light" and before the winds hit high speeds. She cites that it is too dangerous to do once the high winds are present, and adds that the tremendous power surges that occur during storms can be expensive experiences.

Both managers also suggest that stations always back up computers and make sure any outdoor equipment is secure. Deason learned from experience by losing one of his Scott Studio systems and a satellite dish during Hurricane Bertha.

Phone systems with battery backup are good for the three or four hours it may take to get your phones hooked up to the generator as well. You will also a working fax machine to receive information from emergency management and other officials during the storm.

WGNI installed a two-way radio system so the engineers can easily talk to the radio station without getting a busy signal through phone lines

Deason prefers propane fuel for his studio generator. He said it produces sufficient voltage to run the equipment properly. He still uses diesel fuel at the transmitter sites, and needed more than 1,000 gallons during Hurricane Fran. The rural site of the WKXB transmitter was without power for six days.

"You also want inform you listeners as to how you will be covering the storm," Deason says. "We explain we have generators and we'll be on the air unless a tower falls."

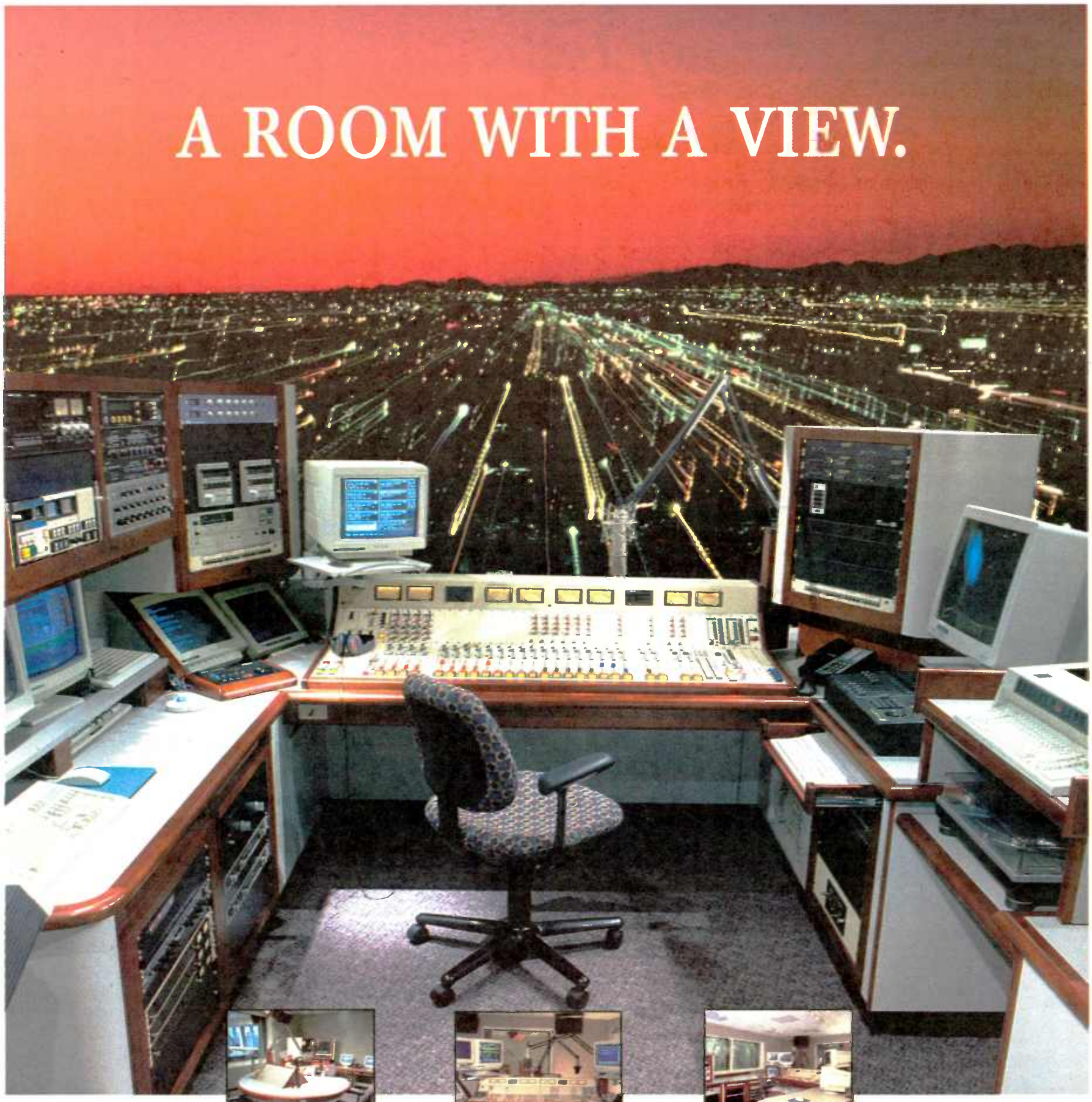
Gage offered an interesting suggestion. "I put my D.J.s in mostly dark studios, so they could live what the listeners were living. It's much easier to understand what the listeners without power were going through that way."

Both managers stress the importance of post-storm coverage. Gage's stations used a computer program called "Storm" from Binex Custom Software. This program organizes all power and school closing information as well as names, addresses and phone numbers. The program was easy for the air personalities to use and would self-delete outdated information.

□□□

Brian Holmes is evening air personality for oldies WSRZ(FM) and OM of all-news WSPB(AM) in Sarasota, Fla. He is also an anchor for Metro Traffic-Tampa and a radio columnist for Music Forum Magazine in Tampa. You can reach him at (941)388-3936 or at Raydiodude @aol.com

A ROOM WITH A VIEW.



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Everybody Do the Big Band Jump

by Alan Haber

ATLANTA Hey, guys 'n' gals, do you know what time it is? The big hand is on the "12" and the little hand is on the "1," which means it's one o'clock and time to do the "Big Band Jump"!

If you listen closely, you can just about hear the horns blaring and feel the beat of the drums as the music overtakes you. The dulcet-toned Don Kennedy celebrates a glorious musical age in a weekend two-hour syndicated show.

"The music of the big bands brings back specific memories for people who lived in that era," said Kennedy. "People remember specific songs from the big bands and tie them to the time that they left their sweetheart and went off on the train to camp, or jumped on a ship and went overseas."

Big band man

This genre is "musically excellent," said Kennedy, and is not "calendar-based" but "style-based." Kennedy, who started in radio at age 13, is one busy big band man: "Jump" airs on about 130 adult standard stations; a one-hour non-commercial version airs on about 15 public radio stations. Another show, aptly named "The Don Kennedy Show," adds more features and more vocals to the host's mix.

"Big Band Jump" began 13 years ago as "One O'Clock Jump" on WRAS(FM), the Georgia State University radio station. Student manager Jeff Walker asked Kennedy to air his records because Walker knew that Kennedy was a big band enthusiast from his days working at WATL, a UHF television station Kennedy had owned in Atlanta.

Taking Count Basie's theme "One O'Clock Jump" as his own, Kennedy brought big band music to the WRAS audience for an hour each week. Walker "just thought it would be a novelty to show the kids the basis of rock, because the basis of rock is big band," said Kennedy, who produces the show in his Atlanta studio.

In 1986, "Big Band Jump" took the syndication route, initially to public broadcast stations and then to commercial adult standard stations. Kennedy, who has been his own syndicator from the start, distributes "Big Band Jump" on DAT, cassette and reel-to-reel rather than compact disc, because of the expenses involved in CD mastering.

"Big Band Jump" is laced with (mostly) Kennedy-conducted interviews with the music's stars. And there's the music: a whole lot of it, 20 percent of which is played from vinyl, the rest from CD. Kennedy even throws in a few 78s, played on his 60-year-old RCA radio station turntables.

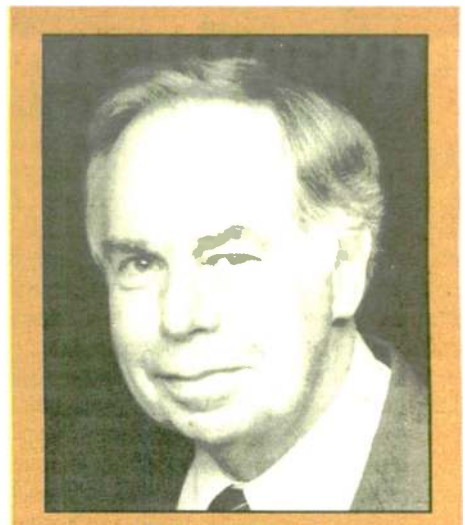
Big band joy

Listeners span the age brackets.

"That's happening more and more," said Kennedy. "When I first started, it was really a 55-plus audience." These days, Kennedy gets calls from younger folks. He recently got a call from a 21-year-old woman who dates "an older man" (he was 25). The couple builds their weekend around listening to "Jump." About a quarter of the letters Kennedy receives are from people under 40 who have discovered the joys of big bands. Kennedy keeps in touch with listeners through a bi-monthly newsletter.

At present, there are only two substantial advertisers on "Big Band Jump," Tylenol and Pepcid AC.

"It's hard to sell advertising," said Kennedy. The problem, he said, "is that advertising agencies think because it's big band that all our listeners either are incontinent or need wheelchairs. And so when you call on an agency buyer who's 28 years old, she says, 'Oh, we don't have any walker accounts or stair-assist accounts.'"



Don Kennedy

"The music of the big bands brings back specific memories for people who lived in that era."

So "Big Band Jump" keeps jumping through advertising revenues, selling big band CDs and cassettes by mail, selling newsletter subscriptions, and promoting a yearly listener cruise to the Caribbean. "We just found if we sell our own stuff," said Kennedy, "we can control what we're doing."

Kennedy, like his listeners, is intoxicated with the big band sound. "My plan is to keep working 'til I drop," he says, "because I'm having so much fun."

OFFBEAT RADIO

'Junk' Network Aims at Boomers

by Dee McVicker

DEARBORN, Mich. Sure, one man's junk is another man's treasure. But is this really the stuff of listenership, and more importantly, of ratings?

The folks at the Collector's Radio Network think so. Later this year they plan to launch, via digital satellite, a 24-hour programming service dedicated to collectibles.

They claim that the collector market is a big baby boomer sale, and growing.

"We're turning into a generation that doesn't want to let go of our youth," said Lowell E. Homburger, a broadcaster and novice collector who recently joined the network as its operations manager.

Homburger speaks from some experience. He got a taste of collecting when he was coaxed into bringing to a rummage sale his collection of soundtracks, snatched up at a radio station he purchased some years ago. He walked away with $2,000.

From Trekkers to auto buffs

He is not the only one bitten by the collecting bug. More than 150 million people in the United States now collect at least one item, be it erasers or Star Trek memorabilia, according to Thomas Eurich Jr., the founder of Collector's Radio Network. Eurich has identified 23,000 kinds of collectibles so far.

"It's almost impossible to keep up any more. I was reading in The New York Times six, seven years ago ... (that) there are 50 million people that collect something related to the American automobile. It might be the car itself, it could be hubcaps, it could be advertising materials. ... How we're going to pack it all in, I really don't know," he said. The biggest challenge for the programming service is to fit it all into the 8,760-hour year.

Eurich has been mulling over that question for the 11 years the programming

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Classical Is Back Live On Air

▶ continued from page 53

radio everybody is very somber and serious and everything is very perfect," she said. "We want to convey how much fun it is to go to a live concert. That's what people don't know. We want the audience to feel the excitement of a live event over the radio."

Time Warner Support

The broadcasts are to be called "Time Warner Presents: The New York Philharmonic Live!" Time Warner's radio sponsorship of the concert series is part of a $650,000 grant that also included support for the orchestra's free summer parks concerts. Teldec Classics International, the record label that has an exclusive recording agreement with the Philharmonic and Kurt Masur, is also owned by Time Warner. The partnership has produced 16 albums to date.

Time Warner chairman Gerald M. Levin, who grew up listening to classical music on the radio, said his interest in the Philharmonic project is personal as well as professional. "Most of my family is involved in education in some way. But the educational system today is not adequate in teaching art and culture," he said. "We think it is important to give money for the arts. Companies need to step up and fill some of the gaps in our educational system."

However, even with Time Warner's backing, Levin noted that much work lies ahead in making the broadcasts successful. "It's probably no accident there are no live radio broadcasts of orchestras today," he said. "We just want to get this thing started again — to get the network up and running. I'm a big believer in demonstrating that things can get done. Then we'll take it from there."

So far a mix of commercial and public stations in New York City, Los Angeles, San Francisco, Chicago, Boston, Cleveland and Baltimore have been cleared for the series. The broadcasts will be available free of charge to stations who commit to air them.

Production chores and nationwide distribution of the concerts will be handled by WQXR, the classical music station owned by The New York Times Company. WQXR has a long history with the Philharmonic; its live broadcasts of the orchestra date to 1938. Gregg Whiteside, the station's chief announcer, will anchor the new series.

The first concert, to be broadcast on Jan. 25, will feature Yo-Yo Ma as cello soloist and includes Leon Kirchner's "Music for Cello and Orchestra" as well as works by Britten and Strauss.

PIONEER PROFILE

Noisy Channels, Silent Nights

by Barry Mishkind

TUCSON, Ariz. Suppose you got a letter from the FCC requesting that your station voluntarily go silent one night a week as a public service. How would you react? That is, after you had phoned your Washington attorney and uttered some unprintable words.

How could going off the air be perceived as a public service? To answer, we must understand something about the way the industry operated and was perceived in its early years.

Finding the station

For a year-and-a-half after the Department of Commerce (DOC) began licensing commercial stations in September 1921, they essentially all shared time on 360 meters (833 kHz). The DOC also set aside 485 meters (617 kHz), but only permitted "crop reports and weather services" there.

At first this was not a real problem except in a few big cities. Few stations existed to share the time; keeping the equipment running and finding enough talent to fill all those hours were the real challenges. Therefore, most stations actually were happy to have others share the air time.

This was also beneficial for listeners, because radio receivers certainly did not have the selectivity that we take for granted today. First, the listener had to manipulate the radio to find the stations. With all stations in the same dial location, the listener could hear the different stations without "retuning."

This is not necessarily to say the stations were locked "on frequency" in the first place. Few stations really knew the exact place on the dial (if indeed the listener had a dial on the receiver). With crystal-controlled transmitters yet a few years off, the station might just "wander" up and down the dial.

In fact, in those days long before frequency monitors, the only way to know where you were broadcasting was when the radio inspector showed up and measured the station. The methodology might seem shocking to us at the close of the century: 75 years ago, the inspector would make a mark by the transmitter dial controlling the frequency — this was 360 meters. Another mark would be made for 485 meters.

Early engineers have remarked that the stability of those then- "state-of-the-art" transmitters was, at best, five to 10 meters. In other words, even if the mark on the transmitter did not get rubbed off, a station on 360 meters might be anywhere from 810 to 855 kHz or so. (This is the main reason that, when the broadcast band was extended, no stations were initially assigned to the channels from 810 to 850.)

The struggle to keep stations on frequency was to occupy the DOC for most of the 1920s. In fact, the Radio Service Bulletins of the time had reports summarizing the frequency monitoring. Stations were listed as within 50 Hz of the correct frequency, 100 Hz, or over 200 Hz. The majority were, yes, more than 200 Hz off.

So, it was something of an achievement for early listeners actually to find the station they sought. Clearly, once he or she found the right place on the dial, the listener did not want to come back the next day and find only static.

Piling all the stations on one channel seemed a good idea, at least at first. But things got nasty very fast.

Stations with the prime evening hours, when listeners were at home to hear, did not want to give up their time to other stations. In many cities, long conferences were required to divide up the air time. Even then, squabbling stations would often broadcast when they wanted, "jamming" the frequency, or purchase more powerful transmitters to override their competitors.

Listeners got a bit steamed about this. For some strange reason, they only wanted to hear one station at a time. Yet, as stations came on around the country, listeners often would find their favorite stations and programs covered by other, closer signals.

Silent Night

One solution was the so-called "Silent Night," when all local stations would stay off the air from one hour to all evening. This permitted listeners to maintain contact with their favorite artists in other markets. For example, Monday evening was set aside for Chicago listeners to seek out distant stations.

How important was this to them? According to an Associated Press story, some stations tried to continue broadcasting on Monday evenings. This prompted a "strike" by listeners who refused to listen to any station in Chicago that violated the Monday evening ban. The listeners won.

Different cities used different "Silent Nights." Reviewing newspaper articles and magazines of the time, we can see that listeners enjoyed "logging" distant stations. Schedules of programs on stations several states away were published regularly in local papers. DX clubs were set up. Some, like the National Radio Club, are still active.

However, as even more stations came on the air, a different solution was

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MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional

Current Technology's New Selenium-Enhanced Plus Models

Current Technology, Inc. introduced three Plus electrical transient suppression filter systems. The XPplus, MPplus and DPplus models are designed to provide critical equipment with protection against damage and downtime resulting from routine electrical disturbance.

Housed in NEMA 4 enclosures, features include: StatusWatch diagnostic monitoring package with audible alarm, alarm/silence test, double form "C" dry contacts for remote monitoring, status indicator lights and more.

For more information from Current Technology Inc., contact the company in Texas at (214) 252-4400; fax: (214) 252-7705; or circle ***Reader Service 92****.*

QDesign Corp. Introduces First MPEG Audio Compression Software

I-media audio provides real-time, studio-quality encoding the processing power of a standard Pentium PC equipped with a Sound Blaster-compatible audio card. It is a 32-bit application designed to enable audio encoding from a live or recorded audio source without the need for any dedicated compression hardware.

I-media Audio offers varying speeds in compression depending on the audio mode, sampling frequency and the processing power of the PC.

For more information from QDesign, contact the company in Canada at (604) 688-1525; fax: (604) 688-1524; URL: http://www.qdesign.com; or circle ***Reader Service 185****.*

Summit Audio MPC-100A

Summit Audio will debut the MPC-100A mic preamp/comp-limiter at the AES Convention, Nov. 8-11 at the Los Angeles Convention Center. The single channel unit features a tube pre-amplifier section followed by a separate tube compressor limiter section.

The MPC-100A offers microphone, Hi-Z (for musical instruments) or line inputs preamplified by the first vacuum tube stage. This signal drives a new compressor/limiter section that offers fast attack times, insuring clipping confidence before entering a digital audio system. A switchable, high-quality, front panel VU meter reads input, output and gain reduction accurately.

For more information from Summit Audio Inc., contact the company in California at (408) 464-2448; fax: (408) 464-7659; or circle ***Reader Service 165****.*

Sennheiser UHF Technology

Sennheiser introduces the SET1081-U and SET1083-U wireless systems. Both feature 16 switchable UHF channels available in three frequency groups for up to 24 channels of operation.

The EM1031-U, a true diversity receiver, is at the heart of both RF systems. It has a frequency response of 40-20,000 Hz. Apart from the receiver, the 1081 system contains a dynamic supercardioid hand-held microphone, a hand-held transmitter offering switchable sensitivity, an output power of 50 mW and a frequency response of 80-18,000 Hz.

The 1083 system contains a high-quality pocket transmitter that can be attached unobtrusively to clothing. It connects to the system's miniature clip-on lavalier mic Operating time is 8 hours. Frequency response is 80-20,000 Hz and output power is 50 mW.

For more information from Sennheiser, contact the company in Connecticut at (860) 434-9190; fax: (860) 434-1759; or circle ***Reader Service 205****.*

Orban Optimod-FM 2200

The Orban Optimod-FM 2200 accomplishes all audio processing and stereo encoding in the digital domain to provide easy set-up, flexible programming options, precision calibration, and stability.

Proprietary two-band processing and high-frequency enhancement create a perceptively louder and brighter sound. The eight factory presets have programmable parameters for bass EQ, HF enhancement, gating, AGC and release time.

For more information from Orban, contact Amy Huson in California at (510) 351-3500; fax: (510) 351-0500; or circle ***Reader Service 186****.*

Big Band Again

The big band sound has a new national outlet. "Play It Again, Ed" with host Ed Walker, a three-hour program of classic and current big band music, debuted nationally in September. The program, on the American View Radio Network, is available on a barter basis via tape or Satcom C-5 Transponder 23.

Ed Walker is an established Washington-area broadcaster, having spent 20 years working with Willard Scott as The Joyboys on Washington-area WWRC(AM) and WWDC(AM). Since 1990, he has hosted "The Big Broadcast," a collection of radio programs from the '30s, '40s and '50s, on WAMU(FM).

For more information, contact Bill Stabler at American View, Inc., (800) 292-5881, or circle ***Reader Service 126****.*

STATION SERVICES

Companies with new product announcements for Running Radio Station Services should send them to:
Radio World, c/o Running Radio Editor, P.O. Box 1214, Falls Church, VA 22041

NBA Action on ESPN

DALLAS The ESPN Radio Network announced its schedule of live professional basketball broadcasts, beginning with coverage of the champion Chicago Bulls versus the Houston Rockets on Jan. 19, 1997. This is ESPN Radio Network's second year of exclusive NBA broadcast rights. During the 1995–96 season, according to its producers, "The NBA on ESPN Radio" attracted nearly 42 million listeners.

Coverage will include 15 regular season games plus a playoff package, the All-Star Game and the 1997 draft.

ESPN Radio is a joint venture between ESPN Inc., and ABC Radio Networks. Commentators for the games include Brent Musberger, Dr. Jack Ramsay, Mike Tirico and Glenn Ordway.

For information, contact Kelley Chapman at ABC, (972) 776-4644, or circle **Reader Service 82**.

Sales and Sports Programs

DULUTH, Ga. Esoteric Sports Tours has geared its 1997 sales incentive, contest and promotional programs toward the radio industry. The company provides complete travel packages to major sporting events, including the Super Bowl, Kentucky Derby, The Masters, The Daytona 500 and basketball's All-Star Game.

"Esoteric Sports Tours provides a one-stop-shop for busy sales and marketing executives," said Carey Dean, vice president of marketing. "One call, and all the details of the incentive or promotion are taken care of immediately."

For more information, contact Carey Dean at Esoteric Sports Tours, (800) 321-8008, or circle **Reader Service 86**.

Agency Superserves Radio

CHICAGO Burrell Communications Group was the overwhelming choice of urban station executives asked by Superadio Networks to evaluate advertising agency performance. Superadio and program producer Walter "Baby" Love presented an award for "Agency of the Year 1996, for Outstanding Achievement, Creativity, Ethics and Longevity" to Chairman Thomas Burrell.

Burrell Communications Group Chairman Tom Burrell, second from right, accepts award from Superadio's Gary Bernstein. Also shown are Superadio's Tim Ivy, left, and producer Walt "Baby" Love.

Urban station managers, sales managers and program directors were asked which agency they preferred to do business with. Among urban contemporary, urban adult, young urban and gospel-formatted station, Burrell was the top pick. The agency also came out on top in other categories including commercial content, sound, creativity, ethics, personableness of staff and ease of doing business.

"We felt that the ratings and comments acknowledging Burrell were so compelling that they deserved notice," said Gary Bernstein, Superadio's president, radio programs.

For more information, contact Leslie Cole, Burrell Communications Group, (312) 443-8603, or circle **Reader Service 84**.

New Biblical Radio Show

FULLERTON, Calif. HCJB World Radio was to begin a new broadcast earlier this month when "Beyond the Call" started its daily broadcast. Hosted by Dr. Ron Cline, the program provides biblically based answers about the Christian faith. "Beyond the Call" is targeted to U.S. audiences.

Founded as a single missionary radio station in 1931, HCJB now operates on short wave and local AM and FM stations and claims to reach 80 percent of the world's populated landmass.

"We want to use 'Beyond the Call' to help Christians ... begin impacting the world around them," Cline said. He is an ordained minister, with a doctor of divinity degree from Azusa Pacific University.

For more information, call Peggy Campbell at Ambassador Advertising Agency, (714) 738-1501, or circle **Reader Service 89**.

Alan Keyes Returns to Radio

DALLAS The newest talk radio program from Salem Radio Network, "The Alan Keyes Show," debuted September 2. The call-in show airs from 10 a.m. to 1 p.m. EST.

Keyes ran unsuccessfully for the Republican nomination for President in 1996. Perhaps the most high-profile moment of his campaign was his arrest in Atlanta, following his attempt to take the stage for a debate in which he was not permitted to participate.

Keyes has worked in talk radio and says he is "eager to get back in the talk radio chair."

"Alan will be the next big winner in talk radio," said Salem National President Greg Anderson. "Conservatives love him and liberals love to engage him."

For more information, contact Leigh Dowe at Salem Radio Network, (214) 831-1920, or circle **Reader Service 105**.

Country Specials for Premiere Radio

LOS ANGELES Huntsman Entertainment Inc., a Nashville-based custom radio production and program supply company, will produce several country radio specials for Premiere Radio Networks Inc., and provide interviews for Premiere's "Country Plain Wrap Countdown."

The first of the special programs, "Martina McBride and Friends Special Live from Nashville," was to air in October. Other pro-

continued on page 70 ▶

Radio for Collectors

▶ continued from page 58

service has been in the making. Slowly, methodically, he has compiled a list of more than 20,000 knowledgeable experts whom the network can call for on-air advice. The programmers are now ready to move into the collectible business.

For drive time, the network will air shows of common interest to the novice collector, from auction reports to collectibles with big numbers behind them such as automobiles, plates and coins. Off hours, it will feature more eclectic collectibles such as bottle caps and thimbles. In some cases, old-time radio shows and music will break up the talk segments.

Toll-free lines will allow listeners to contact hosts directly. Eventually, a TV Guide-like programming guide will be available.

The network will attract "two kinds of people: someone who is really into it, and someone who casually happens by, a button pusher," said Homburger. "There may be programs that will run once a month, that will appeal to a small group of collectors." Others will be on a more frequent basis.

"I can see us doing a car collectible show every day of the week," he said.

Indeed, Art Willard, a well-known Midwestern television and radio talent, will direct and host a program called "Let's Talk Cars," primarily dealing with the collecting of classic automobiles.

A giant swap meet

The producers plan station promotions, such as an annual fair, or auction, sponsored by affiliates. "It's sort of a gigantic swap meet. We'll design the promotion, we'll help each station operate the 'fair' with a proven set of guidelines and it could prove to be an incredible listener and advertiser supported project ... and one that will earn the station some local press at virtually no expense," said Eurich, who is an auction-goer himself.

Currently in the making is a large digital studio located in Dearborn, Mich., not coincidentally near the Henry Ford Museum, the greatest repository of Americana collectibles. Eurich said they plan to take advantage of the museum's large research facilities for those tough-to-answer collectible questions.

The programming network plans to open sales offices in all major regions of the country by early 1997.

So far, a dozen stations have signed up to take the programming feed. Homburger's educated guess is that collector programming will be a pretty good 25-to-54 buy for advertisers, with a secondary 35-to-64 market potential.

Baby boomers like himself, he said, will not only be the biggest takers, but are the most appealing to advertisers and the biggest radio listeners. Homburger and others believe radio is the perfect forum for the collectible market.

"From a demographic standpoint, (the network) gives broadcasters another way to reach this bubble in the population," he said, adding that not all boomers are interested in sports, political talk radio and oldies music.

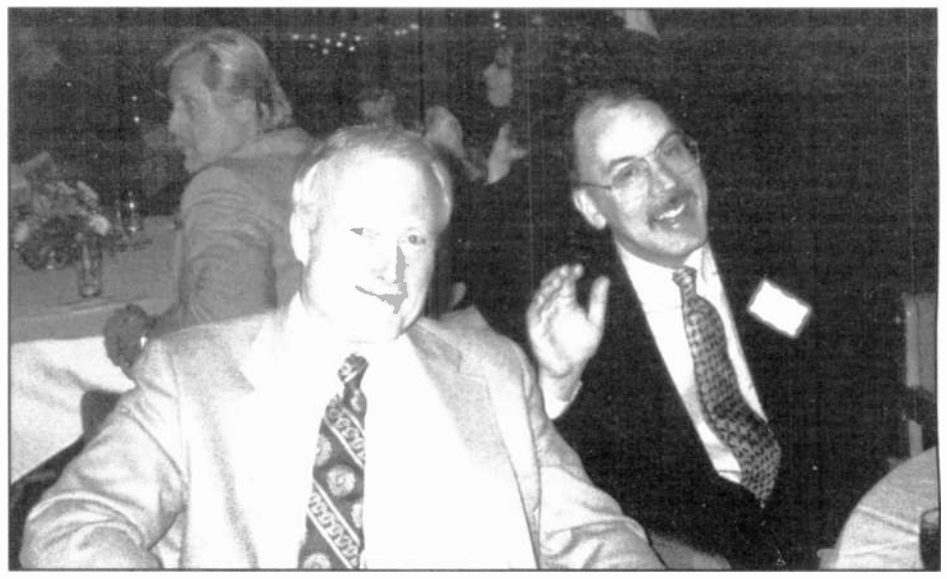
"As a broadcaster and owner of several radio stations, I can tell you that if you look at the Arbitrons, these all-sports stations are very weak. Their numbers basically show good male numbers, 18-to-35. But they're heavily male, very few female. There's no city in the country where any of these stations are standing alone; they all have powerful FMs that are keeping them afloat, and they're doing this basically to add to their FM numbers."

Perhaps. But what about the potential of the collectible format? In answer, Homburger suggested visiting a local bookstore. "Go into the magazine section and look at the number of magazines on collectibles. It's unbelievable," he said.

Lowell and Eurich's vision is to be the first to capture on radio a market served for the most part by the print medium.

□□□

Dee McVicker is a regular contributor to Radio World. Reach her at (602) 545-7363 or roots@primenet.com



Collectors Radio Network Founder Tom Eurich Jr. and President Bob Burnham

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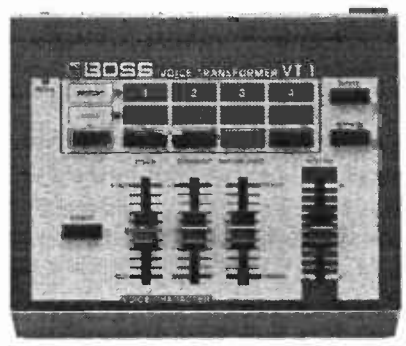

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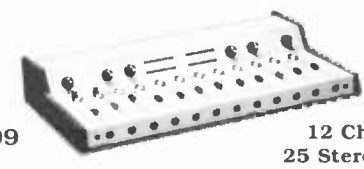

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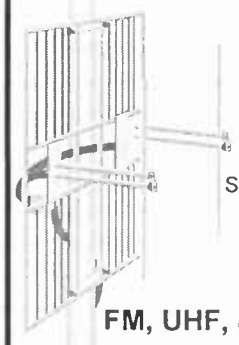

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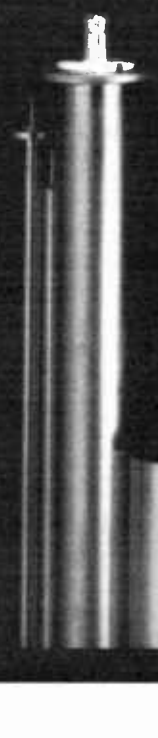

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READER SERVICE NO. 157

ROOTS OF RADIO

Vacuum Tubes Replace Coherers and Crystals

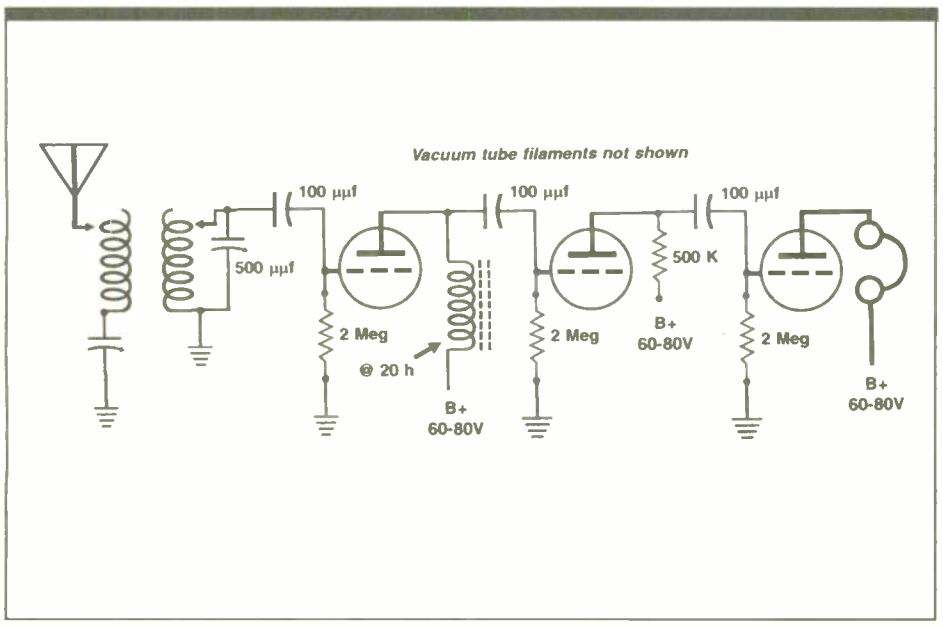
by Ronald Pesha

QUEENSBURY, N.Y. While nearly every radio person outside the armed forces and some commercial facilities was still using coherers and galena crystals for detectors in their receivers, the technology of vacuum tubes was poised to blossom during World War I. Laboratories and individual experimenters found vacuum tubes available for sale. The tube made a better detector and amplification became possible.

Four tuning controls

The schematic shows a three-tube circuit, a detector and two amplification-stages of audio amplification. There's no volume control, because gain is low. Besides, you must fiddle with four tuning controls: two variable tapped coils and two capacitors. Typically the tuned circuits functioned around 1 to 1.5 MHz.

That first stage looks just like an amplifier unless you remember "grid leak" detectors. The earlier, very first vacuum tubes or "Fleming valves" were diodes. They rectified the incoming modulated RF much as today's solid-state diodes and the cat-whiskered "crystals" of old. But Lee de Forest added a control grid, and triodes were off and running.



The grid leak detector applied the modulated RF to the tube's grid through, the 100 mmf capacitor and 2-megohm resistor, acting somewhat as a low-pass filter so that only the audio remained. The value of the grid resistor was not critical, ranging from 1 to 10 megs. Some experimenters made their own by drawing pencil lines on cardboard! The exact value in ohms remained indeterminate. Ohmmeters were unknown, but surely anyone who could afford a resistance bridge for measurement could also buy resistors.

You needed to be well-heeled just to buy the tubes. They cost $7 each ... in 1919! Each socket set you back an additional $1.50. The tube was simply the "Marconi V.T." The Class I was designed for detector use, the Class II for amplification, but they were interchangeable.

The Marconi Wireless Telegraph Company of America claimed that this was the only vacuum tube "which may be sold to amateurs, schools of instruction, and experimenters." Marconi could also supply the fixed resistors, mounted on bases with binding posts. But you wound your own inductances.

The first stage 20-henry plate load inductor seems far higher in value than necessary. A misprint? Perhaps 20 millihenries? Yet the instructions specify 10,000 turns of wire on a 5/8 x 3-inch steel core.

The second stage amplifier circuit looks familiar, yet the tube characteristics curves show that a 500 kilohm load resistor results in a voltage amplification factor of only six. Obviously, with the earphone load in the plate circuit of the final stage, the output operates as a power amp rather than a voltage amp. With such limited gain, you now know why there's no volume control!

Antediluvian circuitry

The filaments operated at 4 V or thereabouts, conveniently obtained from two lead-acid cells, or three cells, a common auto storage battery, with a big rheostat to adjust the current. With all the filaments connected in parallel, total current should not exceed 2.2 amps. If you didn't own an ammeter, then you started with 60 V on the plates and carefully lowered the resistance in series with the filaments "until loud signals are obtained for distant stations."

The variable B+ voltage does offer some gain control. Eighty volts may result in excessive distortion, but avoid going below 60 V. Even at that relatively low plate voltage, you'd better insulate the terminals of your earphones. If the insulation breaks down, you might find yourself receiving shock therapy!

The construction article appeared in The Wireless Age for August of 1919. Shortly thereafter, broadcast stations would begin to proliferate. Broadcasting would soon accelerate the development of receivers, obsoleting this primitive tube and antediluvian receiver circuitry.

Ronald Pesha is Associate Professor of Broadcasting at Adirondack Community College, Queensbury, N.Y. Reach him at (518) 743-2200 ext. 567, or by fax at (518) 745-1433.

Elaine Jones joined **Comrex Corp.** of Acton, Mass., as vice president of marketing.

Jones is familiar to broadcasters from her years with Gentner Communications, from which she recently announced her departure. She will remain in Salt Lake City, according to Lynn Distler, vice president of sales for Comrex.

Jones "is an absolute pro at what she does," Distler said. "I've known her a long time and admired her ability. She knows the industry, she knows our dealers."

Symetrix Inc. named Arvada, Colo.-based **CB Electronic Marketing** as its sales representative firm for the Rocky Mountain region including Colorado, Eastern Idaho, Eastern Montana, Utah and Wyoming.

Marian Sandberg joined **Group One Ltd.**, as a marketing/communications assistant coordinator reporting directly to president, Jack Kelly. Group One Ltd. is an exclusive U.S. distributor for a number of major audio and lighting brands.

Gentner Communications named **Gregory M. Wolfer** as director of sales for conference calling services. Wolfer held the positions of sales representative, sales manager and district manager at Lanier Corp., where he was employed for 14 years.

Museum Lauds Radio on Two Coasts

by Alan Haber

NEW YORK Twenty-five thousand of anything would be pretty hard to fathom for most people. Yet, here in the Big Apple, within the walls of the Museum of Television & Radio, about half a city block from the CBS Black Rock headquarters, approximately 25,000 artifacts from radio's rich history survive ... 25,000 chances to bask in the glow of a most rewarding past.

First home

Established by CBS founder William S. Paley in 1975 as a public showcase for radio and television programming, the museum greeted its first visitors on Nov. 9, 1976, as the Museum of Broadcasting in its first home on East 53rd Street.

Today's majestic incarnation of the museum is visited by radio and TV fans and used as a research facility. It is located in the William S. Paley building on 52nd Street; it opened on Sept. 12, 1991.

A board meeting concluded that, regardless of future new technologies, "there would still always be television and radio."

The new building, designed by architect Philip Johnson, is a monumental testimonial to broadcasting's lasting legacy. A West Coast cousin, duplicating its offerings in New York, was opened in Los Angeles in March. Radio drama, to early classical music, to rock 'n' roll programs are available for public listening.

The museum's new name, adopted in 1991, more accurately reflects its mission. Robert M. Batscha, president since 1981, said that when the name was the Museum of Broadcasting, "People weren't sure if 'broadcasting' meant just radio, or radio and television." The development of new technologies, such as cable, necessitated a new moniker.

Name change

"Moving into the new building," said Batscha, "we had an opportunity to change our name." A board meeting concluded that, regardless of future new technologies, "there would still always be television and radio." As for why the new name put "Television" before "Radio," consider that the acronym for the Museum of Radio and Television is MORT, which in French means "death."

The West Coast facility reflects what Batscha feels is an enormous demand for access to the museum's collection in the City of Angels, where "the creative people are. They wanted to have a place in their own backyard that housed their programs," he said.

With about a third of the museum's 75,000-piece collection devoted to radio, the medium clearly is an important part of its mission. In fact, said Batscha, "Our role with radio in the museum is the same as it is with television. We are an important repository, we are an important archive of radio."

The museum's purpose was to document the history of radio, the trends that have affected it and the creative people who have been involved along the way. Perhaps most important is the goal to make the programs dotting radio's colorful landscape available to the public.

"We're trying to help people understand the richness of radio," said Batscha. The first challenge for him and radio manager Kenneth Mueller along the road toward this goal was to collect radio programming, particularly from the pre-television era. The second challenge, according to Batscha, "was to show that radio didn't end with television."

Regardless of what happens to radio, the medium "will always be there," said Batscha, "and will always find its niche, whether it be in the automobile or in the home or on the beach or wherever it might be."

The museum adds about a thousand historical and current radio programs to its collection each year. "We are actively going after collections ... People, as they (learn about) the museum, are providing us with programs," said Batscha. "There are very few places, if any, that you can go and ... listen to historic radio programs."

A Lost Program series functions as a kind of wanted poster for programs that its staff are seeking, such as some of the early Grand Ole Opry broadcasts and James Dean radio appearances.

Batscha notes that, because radio's history is so rich, "people assume that it's been preserved, and in some cases it isn't." The museum staff urges anyone who has copies of radio broadcasts, particularly from the medium's early days, to contact them. The Museum of Television and Radio can be reached at (212) 621-6600.

When programs arrive at the museum, the staff makes preservation copies on digital video tape and performs restoration work as necessary. Cataloguers audition tapes in real time, and summarize the programs contained on them.

"One of the difficulties of radio is that you can't read the credits at the end of the program, so (credits) have to be researched and fact-checked," said Batscha. Programs then become part of the collection. Some are stored at an off-site warehouse, but can still be obtained by visitors.

Robert M. Batscha, President of the Museum of Television and Radio

Funding

Funding allows activities including seminars and exhibitions and the annual radio festival. Batscha sees a number of ways to raise money.

"One, of course, is the industry itself, which has been very generous. Eighty-five percent of the cost of this building in New York and the one in Los Angeles came from the industry," he points out. "About 15 to 20 percent of our annual budget comes from the industry."

Batscha adds that the museum is "aggressive in raising money from foundations and corporations." Membership is also an important part of its support. A large percentage of members renew.

Not only does the museum offer visitors samples of radio's rich history; it also creates new memories with broadcasts by radio stations from all over the world, originating in its professional broadcast studio.

"It was very important to me ... that we have a broadcast studio in the museum," said Batscha. The idea was to allow the public to "come and see the broadcasts," he said. Also, having the studio "would forever ensure that we were involved in contemporary radio," said Batscha, "and I think that's very important."

The museum has come a long way from the card catalogue used in its former 53rd Street home. Now visitors can search for and reserve programs on Macintosh computers, and hear the programs in the museum's console room (snuggly headsets are provided). The software used to catalogue the collection is powerful; it has cost the museum "well over a million dollars," according to Batscha.

Part of the history

He said it was important that the museum's new building "was compatible with New York." He wanted to create "a building that had stature, a building that would say: In this facility is housed a very important collection that's essentially a part of the history of this century and the centuries to come." Visitor comfort was also important, he said, "because you watch television and listen to radio, not in a mausoleum and not in a public facility or marbled room, but in your home or in your car."

Beyond a nostalgic look at radio's past, the museum offers visitors a sense of history. "I think what we're trying to do," said Batscha, "is enhance the appreciation of a piece of work." To that end, the Ralph Guild Radio Listening Room lets patrons hear the museum's listening series.

Batscha is primed for an exciting future. "Why be a pessimist?" he said. "There's no hope in pessimism."

□□□

*This is the first in a series of occasional articles in **RW** about museums that feature radio.*

Festival: Rock, Baseball, Drama

The Museum of Television & Radio's Second Annual Radio Festival was set to begin Oct. 28 and continue through Nov. 8 (with a break for Election Day, Nov. 5). The 12-day extravaganza features a variety of live broadcasts and seminars, including:

A live broadcast of "Modern Rock Live" with Tom Calderone, beaming out over the Global Satellite Network/WHTZ(FM), New York on November 3, 10:30 p.m. to midnight;

A seminar entitled "Take Me Out to the Ball Game: Baseball on the Radio," with panelists including Bob Wolff, former announcer for the Washington Senators, Minnesota Twins and Mutual's "Game of the Day," on November 4, 6–7:30 p.m.;

A seminar which reunites the gang from New York's Disco 92 WKTU(FM). Look for former air personalities Johnny Allen, Al Bandiero, Freddie Colon and Paco, among others (Wednesday, November 6, 6–7:30 p.m.);

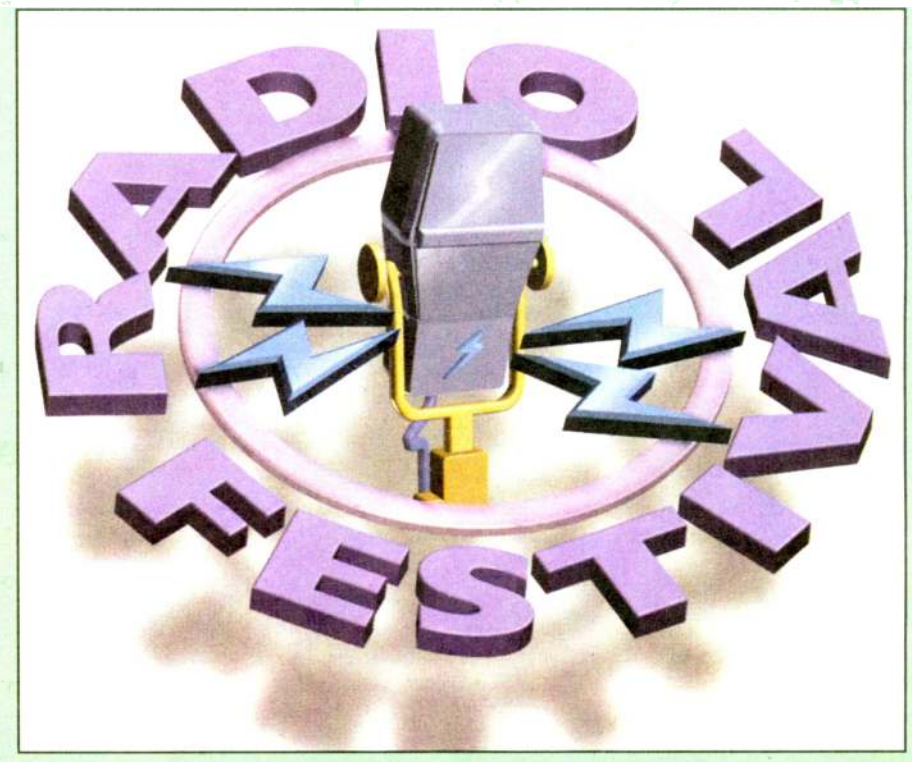
A live broadcast of New York's former WMCA(AM) "Good Guy" Ed Baer's "Ed Baer Affair," broadcast over WHUD(FM) in Peekskill, N.Y. (November 7, 5–9 a.m.);

A seminar entitled "Norman Corwin and the Art of Radio," with Mr. Corwin, one of the most acclaimed radio drama artists (November 8, 12:30–2 p.m.).

□□□

Contact the Museum for ticket information at (212) 621-6600.

— Alan Haber



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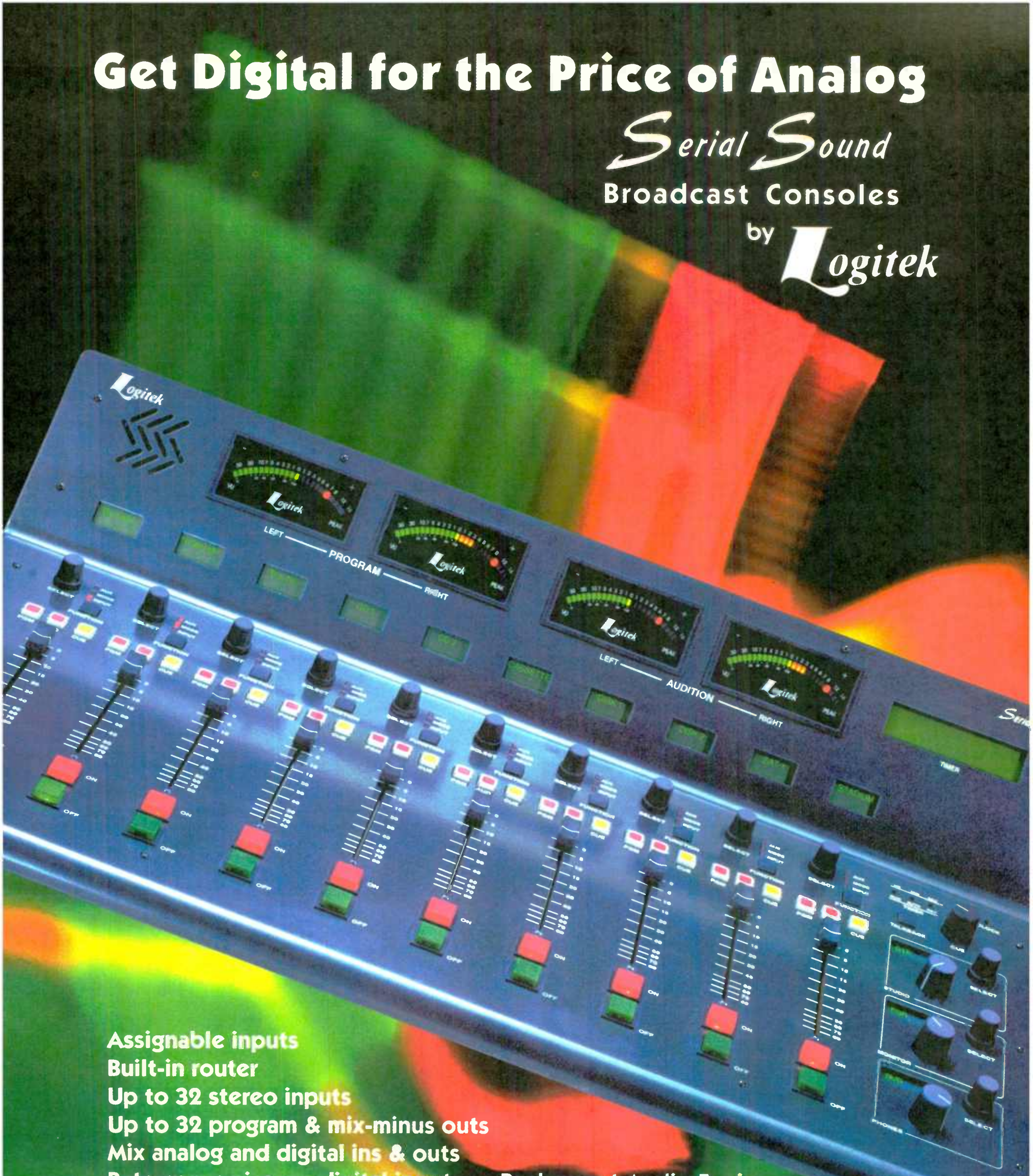

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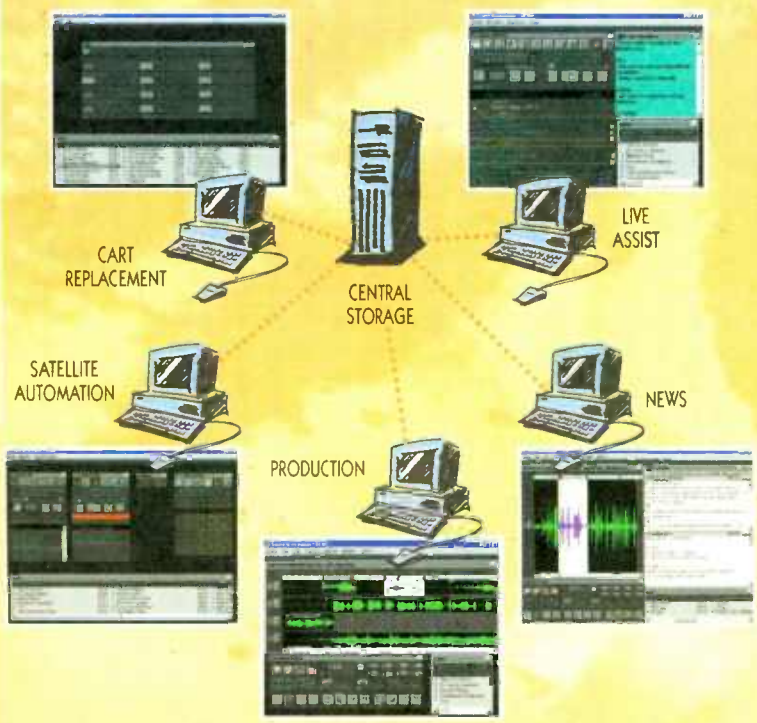

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DIGITAL MEDIA SYSTEM

WORKBENCH

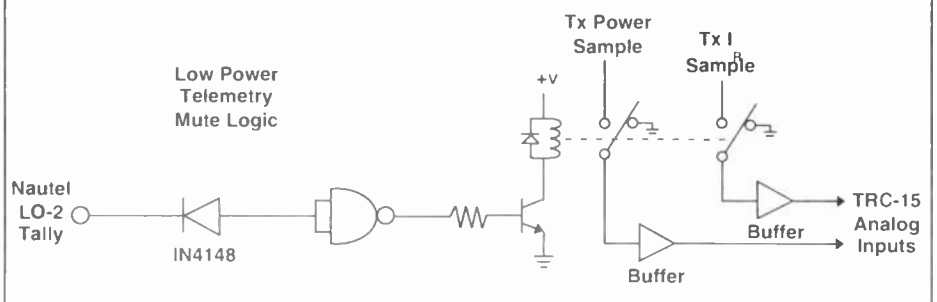
Fix Range Mismatch with Circuit

by John Bisset

SPRINGFIELD, Va. Solid-state AM transmitters are great. Their ability to run at a wide range of output powers provides the best in flexibility, especially for stations with PSA/PSSA or critical hours power requirements. One snag we ran into recently was the wide range of powers and its effect on the input range of a remote control.

In this case, the transmitter ran at 20 kW during the day, but was throttled back to only a couple of hundred watts during PSA/PSSA operation. In order to get enough sample to drive the Moseley TRC-15 remote control during low-power operation, the power and plate current samples were run through a couple of buffer amplifiers, and then into the remote control channels. The problem arose when the station was operating at full power. The DC sample fed into the buffer amps at this power level would be enough to fry the amps.

Figure 1: Low Power Telemetry Mute Logic



The solution is shown in Figure 1. The transmitter was a Nautel, and like other solid state rigs, it has a tally for each mode of operation. For our application, the LO 2 tally was used. When this mode of operation was selected, the Nautel tally goes low, which pulls in the relay. The relay contacts switch between ground and the DC samples.

During low-power operation, the samples are fed into the buffer amplifiers, and the output of the buffers feed the individual channels on the TRC 15. When another mode of operation is selected, the relay drops out, which disconnects the sample voltages and grounds the input of the buffer amps, protecting them from overload or RF pickup. This circuit can be adapted to do other things as well. Thanks to my associate Ed Bukont for sharing the circuit with our readers.

★ ★ ★

As we continue to strive to shave the parts expense budget, some words of wisdom from Mark Persons of M. W. Persons and Associates. Both the McMartin and older Collins 25 kW FM transmitters use a huge 400-watt resistor that measures only 17 ohms. Unfortunately, these behemoths can get hot and die.

If you maintain either vintage transmitter, before you purchase a replacement Mark suggests that you clean off the ceramic core and buy some nichrome wire at a hardware store. The wire comes in a variety of sizes, so you'll need to get the "ohms/ft" value from a reference book. The ceramic form is one-and-a-half inches in diameter.

Not all hardware stores stock nichrome wire, but a good place to start is McMaster-Carr Hardware. They are an industrial supplier, with offices throughout the United States. Reach the Chicago office at (708) 833-0300. The company publishes a catalog; if you call, ask for a copy. For less than $15 in wire, the resistor can be repaired. Call Mark Persons at (218) 829-1326.

★ ★ ★

Installing a new exciter isn't always plug and play. On a Harris FM 20H, for example, you may need to adjust the strap placement on the IPA input. Unsolder the bus wire lead and slide it up or down to get the best exciter loading. Trial and error will get you to a point where the VSWR is almost unreadable

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Bandwidth Congestion Alleviated

▶ continued from page 59

required. Some channels had as many as seven to 11 stations fighting for air time. The cacophony became so great that the DOC was forced to allocate additional channels for broadcasting in May 1923. Although it carefully sought to assign stations so as to reduce interference between them, and imposed sharetime arrangements up and down the dial, listeners were still adamant about having their Silent Nights.

It was a challenging time, too, for engineers trying to construct new stations. In many cases, they were forced to use out-of-town locations, so the new station would not "overload" receivers and prevent reception of more distant stations. In other places, local cities refused any and all locations, complaining to the DOC and the Federal Radio Commission, actually boycotting stations that dared to "harm" their reception of distant stations.

Nevertheless, the number of stations continued to grow. Time slots were harder and harder to acquire. Eventually the pressure for local time caused a breakdown of the Silent Nights, and in late 1927, the AP reported that the Chicago stations had decided to return to the air on Mondays.

By then, better receivers were available, using tube technology to make them more selective and sensitive. Also during this same period, network broadcasting had begun, bringing the best talent in the country to virtually every market. Together, the result was less pressure from listeners to hear distant stations. Then it was merely a matter of time before Silent Night was just a memory to radio listeners across the country.

□ □ □

Call Barry Mishkind at (520) 296-3797. Send e-mail to barry@broadcast.net or find his home page at http://www.broadcast.net/~barry/

STATION SKETCHES

Keep Close Eye on Circuit Breakers

Proper Circuit Breakers for Your Transmitter Essential to Maintaining Good Regulation

by Tom Vernon

HARRISBURG, Pa. In the Oct. 2 RW, I began a discussion of transformer impedance and how it influences other parameters in power supply design and component replacement. This time I'll continue on that theme with a discussion of rectifiers and circuit breakers, and talk a little about power supply maintenance.

Until recently, observers often asked about the lack of published information on percent regulation of power transformers. Back in prehistoric times, when mercury vapor rectifiers were used for rectification, it didn't matter. By today's standards, mercury vapor tubes have many shortcomings, but the one good thing about them is their relative immunity to current surges.

Diodes short out

In addition to forward current, diodes are rated for short circuit current, typically for either one cycle (16.7 milliseconds) or four cycles (67 ms). Any short circuit that is sustained for longer than the specified time will probably destroy the rectifiers. Typically, the diodes short out. This matter of timing leads us to the next part of the system, the circuit breaker.

If the breaker doesn't open when overcurrent conditions are sustained for longer than four cycles, they don't do us much good. Such incompatibilities can occur when the original power transformer is replaced with a generic type, or in older transmitters where the mercury vapor rectifiers were replaced by diode stacks.

Most circuit breaker data sheets have a graph of percent overload current vs. time to open. Usually the higher the overload current, the faster the circuit breaker reacts. Typically they will open in four cycles at rated current.

Going back to the examples from from the Oct. 2 article, we found that a 2.5 kV plate transformer specified at 1 percent regulation yielded a short circuit current of 326.5 amps, and a similar transformer with 7 percent regulation would have a current rating of 46.6 amps. With the 1 percent transformer, we could use rectifiers rated at 326.5 amps (plus a suitable safety margin) with a four-cycle (67 ms) breaker. Similarly, our 7 percent transformer would require rectifiers with a short circuit rating of 47 amps. You begin to see the false economy of using a poorly regulated transformer and low-current diodes. The results can be disastrous. Some engineers try to solve this problem by using faster circuit breakers, but this also has some bad side effects. Circuit breakers that open quickly are more prone to false trips because of short duration transients. This means lost air time

continued on page 72 ▶

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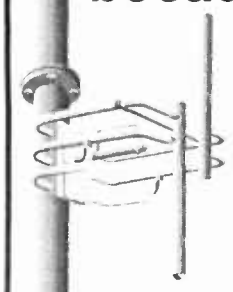

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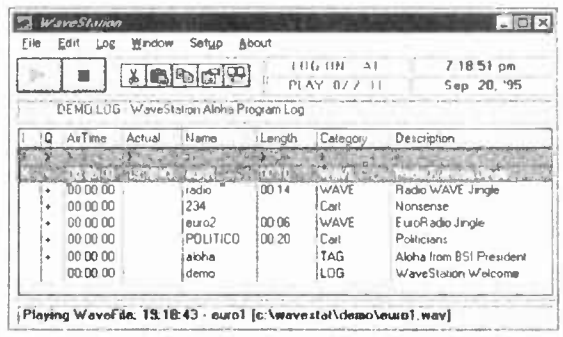

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STATION SERVICES

▶ continued from page 60

grams to be produced for Premiere will air during the coming year.

Huntsman Entertainment Inc. has an affiliate base of more than 700 stations. Among the previous country music specials it has produced are the weekly "Country HitMakers" and "Nashville Audio Clip Service," and one-hour specials such as "The Clint Black Story" and "A Vince Gill Christmas." Premiere Radio Networks, Inc. has contracts with more than 4,700 radio station affiliates.

For more information, contact Ron Huntsman at Huntsman Entertainment, (615) 255-1100, or circle **Reader Service 110**.

Automobile Program Debuts

TOLEDO, Ohio Those with questions about their automobiles now have a new forum: "The Consumer Automotive Repair (C.A.R.) Show." Roger Kwapich hosts the two-hour syndicated call-in show, drawing on his own 20-plus years of experience in the automotive industry. Other experts frequently are invited to take part in the program.

"By giving listeners an opportunity to ask whatever questions that are on their mind, they can really learn about how their car works, and what it might take to fix it," said Kwapich.

The "C.A.R. Show" is syndicated across North America via satellite linkup.

For more information, contact Tom Moore at the "C.A.R. Show," (419) 969-9980, or circle **Reader Service 108**.

Golden Radio Offerings

BEVERLY HILLS, Calif. The American Association of Retired People (AARP) has signed on as sponsor of the George Burns and Gracie Allen half-hour comedy series, distributed by Charles Michelson Inc. AARP is using the sponsorship to launch a month-long "new members" campaign. The sponsorship began in September, with the program airing on approximately 200 radio stations countrywide. Preferred air time is between 9 and 11 p.m., Mondays–Sundays.

Charles Michelson Inc. also placed the hour-long "The War of the Worlds" on over 185 U.S. radio stations, two commercial networks in Germany and the BBC. "The War of the Worlds" is scheduled to air on October 31.

For more information, contact Charles Michelson at Charles Michelson, Inc., (310) 278-4546, or circle **Reader Service 107**.

Albright Launches Consultancy

SEATTLE Jaye Albright, country radio consultant, and Edith Hilliard, president, Broadcast Programming and BP Consulting Group, announced that effective November 1, 1996, Albright will focus on her independent consultancy, begun last year under the name RadioIQ.

She will continue under a management consulting contract with Broadcast Programming and contribute regularly to BP publications and seminars.

Albright in a letter to clients, wrote that there were no 'philosophical differences' or 'major conflics' underlying her decision to leave BP. Albright resigned her position last fall as BP's consulting general manager.

Albright's clients have been offered the option of working with her exclusively, retaining some BP services and working with her, or working with only one of BP's other country consultants, L.J. Smith or Ken Moultrie.

In her letter to clients, Edith Hilliard wrote, "Our goal is to ensure that you continue to work with the people and receive the services that best meet your needs."

Fix Range Mismatch

▶ continued from page 67

on the new exciter. You don't have to settle for high VSWR.

A similar situation occurred on a CCA 20,000. In this case, the range of the input network did not permit all of the reflected energy to be reduced. Here, we ordered new components to give us better tuning range. Thanks to my associate, Scott Taylor, for sharing these tips.

★ ★ ★

If you own any Sony equipment, especially consumer-grade CD players, you'll want to call the Sony Publications Department at (816) 891-7550. Located in Kansas City, the center will accept credit card orders for its service manuals. Even if you don't own a Sony product, you may want to pick up one of the CD manuals, because they are detailed and thorough, and offer service tips that may be applicable to other players.

□ □ □

John Bisset is a principal in Multiphase, an engineering services company based in Washington. Reach him at (703) 323-7180. Tips for this column are encouraged, and published submissions qualify for SBE recertification credit. Fax them to (703) 764-0751, or send e-mail to WRWBENCH@aol.com

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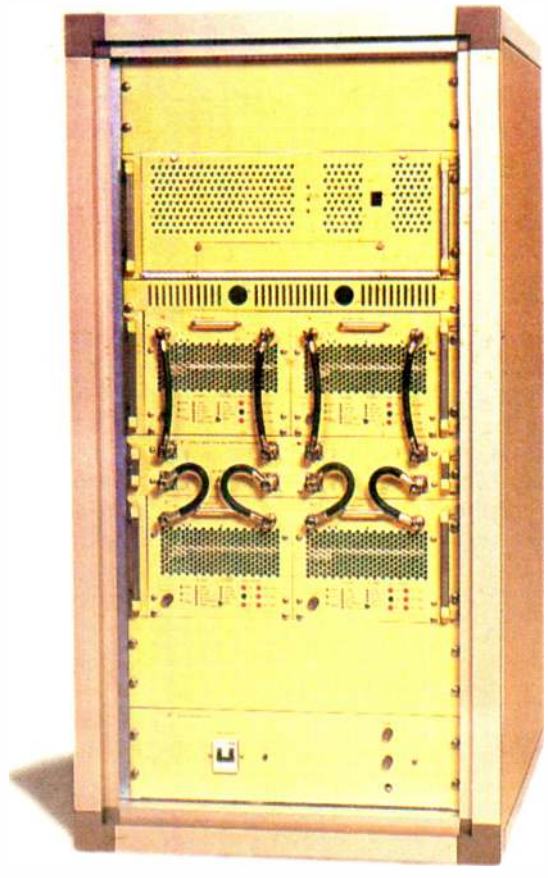

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Circuit Breakers

▶ continued from page 68

and frequent trips to the transmitter site.

To summarize, low-impedance transformers give good regulation and require high current rectifiers and normal circuit breakers. On the other hand, high-impedance transformers give poor regulation. They can operate with low-current rectifiers, but require fast-acting circuit breakers.

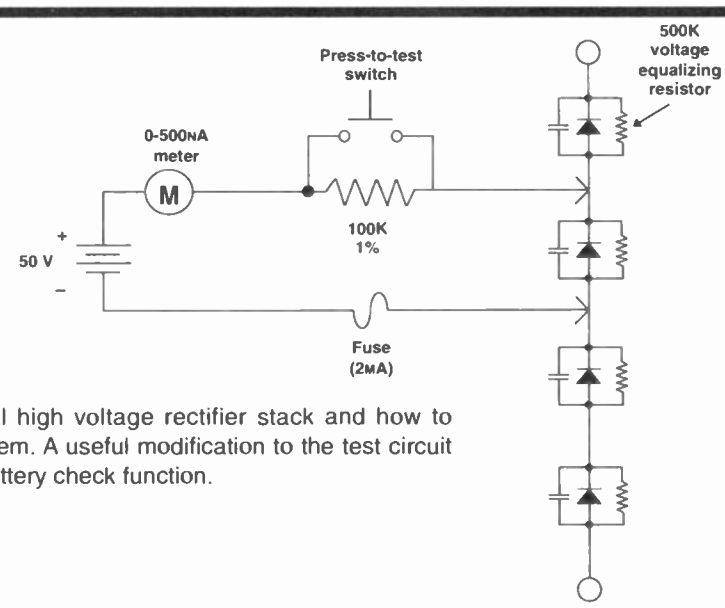
Sometimes AM transmitters with well-regulated supplies are blamed unjustly for poor carrier shift performance, when the problem is really with the AC supplied to the transmitter.

You can easily determine where the problem lies. Connect an AC voltmeter across the line input to the transmitter and measure the voltage with unmodulated carrier and 100 percent modulation. If the difference in line voltage with and without modulation is greater than 5 percent, suspect problems with the utility supply. Perhaps the pole transformer is underrated or the AC wiring is of inadequate size. In many cases, line regulators can improve the situation.

Another point to ponder is the validity of making these measurements with both the main and auxiliary transmitters on. Ideally, service should be adequate to run both at full power, but this is not always the case.

Poor regulation can also result from improper transmitter adjustments. If you still have problems after you have put power supplies in order, check out tuning, loading and bias adjustments.

Figure 1



Typical high voltage rectifier stack and how to test them. A useful modification to the test circuit is a battery check function.

Aside from cleaning and occasionally cycling the circuit breaker to wipe the contacts, and checking for blown metal oxide varistors, routine maintenance of the power supply is largely a matter of checking the diodes in the rectifier stack. Recall that the usual failure mode for a diode is a short circuit. Lightning surges can occasionally short a diode or two in a stack with no problems or outages. Then a few more go until the forward current exceeds the capacity of the remaining diodes, and suddenly you are off the air.

An old standby

You can prevent these outages with regular inspection of the diodes in the rectifier stack, but unfortunately it is not as simple as checking small signal diodes with an ohmmeter. Figure 1 illustrates a typical rectifier stack. The equalizing resistors and capacitors are there to insure that applied voltage is distributed evenly across all diodes. In the case of stacks where the components are soldered, the thought of removing one end of each of 50 or more diodes so they can be checked with an ohmmeter can be mighty discouraging. A DVM may not give accurate readings on these large devices anyway. Fortunately, there is a better way.

The test circuit shown in Figure 1 is an old standby that was published in many RCA transmitter manuals. It is easy to build, and allows you to reliably check all the diodes in circuit. Note the 100K resistor and 'press-to-test' switch. They protect the meter from shorted or reversed diodes. Connect the circuit across the diode, observing polarity shown in the diagram. We are now ready to measure reverse current. If the diode in question is shorted or you have the leads reversed, the meter will read around 500 uA.

DO NOT press the test switch. When the "press-to-test" switch is operated with a good cell connected and proper polarity, the meter should indicate around 100 microamperes. A cell that is bad may show several hundred microamperes. Next reverse the connections. A good cell should show around 500 microamperes. A low reading here indicates poor forward conduction or an open cell. Note that this circuit does not work for equalizing resistors less than 500 K. In such cases, the equalizing resistor must be removed from the circuit.

□□□

Tom Vernon divides his time between consulting and completion of a Ph.D. You can e-mail Tom at TLVernon@AOL.com *or call (717) 367-5595.*

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Altec 1589B 2-input mixer/amps w/one balanced line xfmr input each, excl buffer/isolation amp. $50/both + shpg. C Ware, Blue Ridge Audio, 10011 Villa Lea Lane, Houston TX 77071.

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Marantz 1 audio consolette preamp, single or pair & model 6 stereo adapter. P Chance, Imperial Analog, 925 Clinton St, Philadelphia PA 19107. 215-574-8147.

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Andrew 7/8" foam, 175', new, $500. R Coleman WHHK, 937 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

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FRE 37 CP 12 gd cond w/heaters 97.9 MHz center fed w/face mounts for 24" tower face, $5000. G Gibbs, KSEZ-FM, 1113 Nebraska St, Sioux City IA 51105 712-258-0628.

Pyrod 208' lighted guyed tower, located at Quanset Point, North Kingstown RI, geographic center of state. 401-295-7160.

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Eventide H-910 harmonizer, factory refurbished, $350/BO. J Winters, Winterssound, 45 E Washington St, Elizabethtown PA 17022. 717-367-1119.

Eventide H3000 D/SE harmonizer in mint cond, pitch change, delays, flanging, vocoding & much more, $1850. D Popp, Colors Audio, 93 Marvin Ave, Akron OH 44302. 330-869-5644.

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Audio Arts 4200-A stereo EQ, Drawmer 201 Gate, Panasonic 3500 DAT machine, Gates M-5576 vintage tube line amp, Eventide H-949 Harmonizer, Telefunken V-72, Altec plug-in transformers. T Coffman, 619-571-5031.

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McMartin 802 stereo, 8-chnl cntrl board, needs TLC, spare parts, $250. M Taylor, KNEO, Neosho MO. 417-451-5636.

Orban 111B (2), $175/ea or BO; Aphex AX Type C aural exciter, $75/BO. T Payne, KTMC, POB 848, McAlester OK 74502. 918-423-1400.

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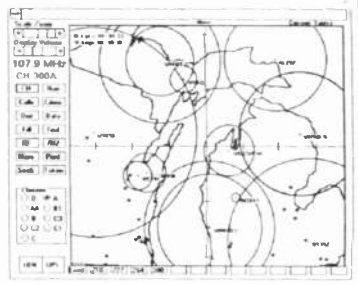

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CBS Labs Audimax RIIZ 443 tube type auto level cntrl, BO or trade J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803 812-877-2663

Orban Optimod-FM 8100A gd cond removed from active service in 8/96, compressor, limiter, stereo gen, stock boards 3 thru 9, $2995 L Stang, WPGM, 8 E Market St, Danville PA 17821, 717-275-1570

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UREI or Teletronix LA2A, LA3A, LA4A, 1176, Gates, RCA, Collins, Altec, DBX160/165, all types, working or not T Coffman, 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, 214-271-7625.

MICROPHONES

Want To Sell

Luxo mic arms (2), $50/both +shpg, L Spivey, WSNR, 1121 South Main, Hartford KY 42347, 502-298-3268.

Sony ECM-55B, (2) Lavilier mics in case, great shape, $100 ea, G Hultman, Hultman Media Srvc, 300 Limpy Creek Rd, Grants Pass OR 97527, 541-474-6466.

AKG 451-E/Shure SM-7 T Coffman, 619-571-5031.

Astatic UG10DAL 500 (5) NOS chrome bullet dynamic, $100/ea M Schackow Mark Schackow Rec, 307 4th Ave E, Lemmon SD 57638 605-374-3424

Electro-Voice 635A dynamic omni mics, $85/ea, Tom, 970-223-6078.

Sennheiser MKH 816 P48 long shot gun mic, near mint cond, will swap for a Neumann U-47FET, physical cond not important, J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803, 812-877-2663.

Sennheiser MD421-U5, clean, $300, M Crosby, 408-363-1646.

Want To Buy

AKG 414 or CAD E-200 in gd cond W Dougherty Jr, WLD Recdg Std, Music Valley Rt 1, Mill Spring MO 63952, 573-998-2681

RCA 77 & 44, Neumann, Sennheiser, EV, Altec, Coles, T Coffman, 619-571-5031.

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

RCA 77-DX's & 44-BX s, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214-271-7625.

Sennheiser, Neumann, AKG, many models, W Gunn, Box 2902, Palm Springs CA 92262 619-320-0728

MISCELLANEOUS

Want To Sell

1964 Rock-O-La stereo juke box, gd cond w/manuals, $1500, D Leutz, KKBN, POB 708, Twain Harte CA 96303 209-586-1988.

Nikko AM-FM tuner, $50; Schafer racks, $100, General Radio 1931B AM mod mon, $200; Telfax TFX31 sports mixer, $400; Extel printers, $50 ea, D Rose, KDUC, POB 432, Barstow CA 92312, 619-256-2068.

Samson TX-3 beltpack xmtr, ant & (2) mic connectors, chnl 7, $150, G Hultman, Hultman Media Srvc, 300 Lumpy Creek Rd, Grants Pass OR 97527, 541-474-6466.

Schafer racks (3), 66.5" high, 22" wide, 17" depth, BO, J Natoli, WBTC, 125 Johnson Dr, Uhrichsville OH 44683, 614-922-2700.

Technics digital stereo tuner, very little use, one chnl dead, $15 +shpg, W Dougherty Jr, WLD Recdg Std, Music Valley Rt 1, Mill Spring MO 63592, 573-998-2681

Fidelipac steel CRT racks, holds 25 per, (2), $2.00/ea, M Taylor, KNEO, Neosho MO, 417-451-5636.

Hnat Hindes SX-87 phone hybrid interface, BO, S Cronen, Starbeat, 9 E Larkdale Dr, Deerfield IL 60015, 847-945-9500

Kenwood D-5 carrying handles, 1 pair, new in box, BO, J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803, 812-877-2663.

RCA open wire transmission, line insulators/brackets (60), will sell as whole or any quantity, G Heidenfeldt, WRGH Radio, 2880 W Lake Rd, Wilson NY 14172, 716-751-6187.

USED BROADCAST EQUIPMENT: parts, tubes, mic's, etc. Call Joe Tunnell, 205-822-4643 for fax list.

Want To Buy

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid, B Rose, Program Recdgs, 228 East 10th, NYNY 10003, 212-674-3060.

RECEIVERS & TRANSCEIVERS

Want To Sell

Erko SCA rcvrs, gd cond, SCA, BO, R Coleman, WHHK, 937 SE 2nd St, Box 222, Galva IL 61434 309-932-2288.

GE Master II & MVP 138-151 2 meter 45W repeater, PL, preamp needs cntrlr, $125; GE MVP (4) 20W UHF mobiles, preamp, PL & access, $75/ea, P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011, 207-725-3066.

Radio Shack PRO 2035 1000 chnl scanner 29-1000 MHz, like new, $80 + shpg; Telefunken Jubilate 5351 W German AM-FM-SW radio tube type w/schematic, works good, $30 + shpg; Motorola Power 8 AM port transistor radio, late 50's model, $5 + shpg; Regency ACT 10-HLUE 10 chnl scanner crystal type, works, $25 + shpg, E Lightman, WEOL Radio, 550 Merchant St, Ambridge PA 15003, 412-266-2802.

RECORDERS

Want To Sell

Ampex 440C-8, mint cond, manuals, test tape, roll around console, $3000; Mitsubishi X-80 2 trk flight cases, vgc, $650 B Ganslen, Ganslen Audio, 1250 Valencia, Lewisville TX 75067, 214-436-2206.

Audi-Cord DL mono cart reproducer, like new, w/manual, $650 B McKittrick, 331 Mulberry St Catasauqua PA 18032, 610-264-5295.

Carver PDR-10 CD rcdr, mint w/full inputs & outputs w/optical, balanced, unbalanced, mic, stand alone rcdr, BO over $2000, S Nelson, Clarion Prod POB 2883, Littleton CO 80161 303-789-4494.

Crown SP 724 & SX 724, 10" reel, 4 trk stereo, 7.5 & 3 75 IPS in travel cases, working when removed from service in 1988, $350/both or BO H Jeschke, Fellowship Press, 5820 Overbrook Ave, Philadelphia PA 19131 215-879-6300

Dictaphone 5402 complete pair of 911 40 ch rcdrs & controls, BO, C Bucy, Cisco Snd, POB 16583, Lubbock TX 79490 806-792-1662.

Otari MX4040 4 trk r-r w/remote, excel cond, $1500, Tascam 44 4 trk r-r tape deck w remote, vgc, $1500; ITC 750 Series r-r PB only, deck in fair cond, $100, Ampex PR-10 r-r deck w/MX-10 Ampex mixer, fair/operates, $150, Sony 250 r-r deck, needs heads aligned, gd cond, $100; Sony TC-8 8 trk cartridge rcdr, needs work, $100, D Leutz, KKBN, POB 708, Twain Harte CA 96303, 209-586-1988.

Otari ARS1000 player, $350; Revox A77, $150; Ampex 350 player, $150; ITC 750 player, $150; Otari 5050, not working, $500, D Rose, KDUC, POB 432, Barstow CA 92312, 619-256-2068.

Sanyo stereo cassette deck, works but needs new heads, $10 +shpg, W Dougherty Jr, WLD Recdg Std, Music Valley Rt 1, Mill Spring MO 63952, 573-998-2681.

Scully 284B-8, fair cond, works, $3500, MK8511 for parts, $75, Ampex AG440C, has click but works, $200, H Sewell Oakridge Music, 2001 Elton, Haltom City TX 76117, 817-838-8001.

Sono-Mag 250 (3), BO J Natoli, WBTC, 125 Johnson Dr, Uhrichsville OH 44683 614-922-2700

Scully 280-4 4 trk 1/2" recorder in roll-around cabinet, gd working cond, $800/BO F Badeaux The Musik Faktory, 1812 Procter st Port Arthur TX 77640 409-982-7121

Tandberg 12-41 7" reel rcdr, 4 trk stereo, 1-7/8, 3.75, 7.5 IPS, working OK, $150/BO, H Jeschke, Fellowship Press, 5820 Overbrook Ave, Philadelphia PA 19131 215-879-6300.

Tascam 34-B r-r 1/4" tape deck, $1000, R Coleman, WHHK, 937 SE 2nd St, Box 222, Galva IL 61434, 309-932-2288.

SERVICES

RECORDERS...WTS

Teac A3340S 4 trk 1/4" r-r w/simul-sync, vgc, $400; Teac 40-4 4 trk r-r, vgc, $400; Revox PR77, for parts, $75/BO. J Winters, Winterssound, 45 E Washington St, Elizabethtown PA 17022. 717-367-1119.

AKAI CR-80D-SS 8-trk cart rcdr, unit plys & rcds in stereo or quad. BO or trade. J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

Ampex ATR-700 w/o side panels, working when removed from service, $150 + shpg; Sony TC-105 7" reel rcdr, $40 + shpg. C Ware, Blue Ridge Audio, 10011 Villa Lea Lane, Houston TX 77071.

MCI JH16 8-trk 1" multi-track rcdr w/Autolocator III, spare parts kit, mint, $2999/BO. S Cronen, Starbeat, 9 E Larkdale Dr, Deerfield IL 60015. 847-945-9500.

Otari 5050 series, head nest is missing, $250; Otari 5050 series complete, $500. M Taylor, KNEO, Neosho MO. 417-451-5636.

Otari ARS 1000 (3) DC stereo PB w/25 Hz cue detector; (3) ITC 770 stereo PB w/25 Hz cue detector; (3) Technics RS-1506-US play/rcd, 4-trk stereo; 2 persons programmers, 3A w/auto sequence. Kevin, 406-232-5626.

RCA RT-11 transport only, for parts, BO. B Leslie, Pro Recording Service, 13708 Mapleleaf Dr, Cleveland OH 44125. 216-662-1435.

Tascam MSR16 less than 50 hrs, dbx NR, $2500. M Schackow, Mark Schackow Rec, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

Ampex AG602-2, stereo, rack-mounted, $250; (2) Ampex Sampsonite cases for 600 Series, mono, brown, $50/ea: stereo, grey, $50. M Crosby, 408-363-1646.

New & used Ampex 350 style tape transports, motors & parts, various prices. M Crosby, 408-363-1646.

Otari MX70's 16 trk 1", mint, 150 hrs w/video layback system, $6950; Tascam ATR60-2 in stand, $1200, Tascam ATR60-8, $2750: Tascam 58 8 trk, $1950; Tascam 38 8 trk, $1650; Otari 5050-8 Mk III, $2200; Ampex 440C-8 1", $2900: Ampex 1200 PURC cards, $400 ea: nakamichi 550 portable cassette, $250; Custom locator for ANY deck, $495. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Otari MX70 16 trk 1", like new, 150 hrs, $5950; MX70 video layback system, $900; gd used 1/2"x2500' 456 tape, $20; 1"x2500' 996 & 250, $35; Nagra III sync rcdr w/SLO resolver, $695/both; Nakamichi 550 great port cassette, $250; new 2" MRL short test tapes, $229. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Revox A77 recdrs (2), both need work, $50/ea. M Crosby, 408-363-1646.

Want To Buy

Ampex 351 solid state amp. B Hansen, KCNO, POB 570, Alturas CA 96101. 916-233-3570.

Sony 5000 series U-Matic 3/4" plyr. J Powley, 716-942-3000.

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

Ampex machines, record electronics, mixers. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

REMOTE & MICROWAVE EQUIPMENT

Want To Sell

2-line Comrex, $1000; Shure mixer, $400. T Balistreri, WAUK, POB 51332, New Berlin WI 53151. 414-784-2863.

REPAIR SERVICES

MIDWEST DIGITAL SERVICES, INC. (Chicagoland area): Premium Dat Service; Sony Pro Specialist since 1985; Quick turn-a-round time. (708) 448-7539 or FAX: (708) 448-7678.

SATELLITE SERVICES/EQUIPMENT

Want To Sell

Comrex LX-T encoder for single line freq ext, like new cond, $500. A Slaugh, Ski Areas of NY, 2144 Currie Rd, Tully NY 13159. 315-696-6550.

Marti RPC-40L solid state. 2 frequencies, $1100. R Coleman, WHHK, 937 SE 2nd St, Box 222. Galva IL 61434. 309-932-2288.

Moseley MRC-1600 set up for STL-TRL(TSL) link, excel, $1850; Gentner VRC-1000 w/VRC-2000 software upgrade, like new, $2150. D Leutz, KKBN, POB 708, Twain Harte CA 96383. 209-586-1988.

Moseley SCD-8 subcarrier demod 185 kHz, $200: Moseley TR55A 101.7 telemetry rcvr, $200: Burk TC8 remote w/relay panel, $700; Moseley 303 STL, $800. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Wegner 1601-50 mainframe w/1605, (2) 1945's, 1621, 1622, (2) 1646 plug ins, excel cond, $500 +shpg; Johnson SCA tuner w/manual, $50 +shpg. L Spivey, WSNR, 1121 South Main, Hartword KY 42347. 502-298-3268.

Selectone ST230 1000 call paging encoder w/manual, $50. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Comstream Uplink KU System (2) w/codec, modem, 2.4M dish, 2 W RF amp, pwr controller, UPS, rcvr & all cabling, in service, avail immed, $16K ea/BO. B Victor, Premiere Radio Network, 15260 Ventura, Sherman Oaks CA 91403. 818-377-5300.

Wegener 1600 satellite rcvr set up for SMN star station format, BO. P Hunn, WZZZ, 604 Meadowbrook, Fulton NY 13069. 315-598-8952.

Wegener Panda 1601-50 mainframe sat rcvr complete w/extra cards, $500/BO: extra cards, $50/ea. T Payne, KTMC, POB 848, McAlester OK 74502. 918-423-1400.

SOFTWARE/ DATABASES

Want To Sell

STATIONS

Want To Sell

FM Translator CP in the Atlanta GA area, 10 W ERP. Neil, Immanuel Broadcasting Network, POB 1000, Cartersville GA 30120. 770-387-0917.

10K AM in N.C. AZ. 520-774-0864

STEREO GENERATORS

Want To Sell

Moseley stereo gen, one is missing meter, $250; Moseley stereo gen, complete, (2), $300/ea. M Taylor, KNEO, Neosho MO. 417-451-5636.

TAPES/CARTS/REELS & CD's

Want To Sell

Approx 5000-6000 45s, some LPs, from 50's thru 80's, gd cond, cataloged, sold as collection only, $3950. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Fidelipac Gold Master carts, music lengths, excel cond, $.50 ea + shpg in 100 lots; 10" music reels, $1 ea +shpg. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

KLEI's famous Hawaiian LP collection from 1945 thru 1976, plus Standard Transcriptions big band 12" Shorty collection 1000-1058 along w/other LP's, will not divide, $1950 +shpg. C Fuller, VOICES, 241 Douglass Way, Bolingbrook IL 60440. 630-739-0044 during business hours.

Fidelipac cartridges, all lengths, gd cond, $0.50/ea. M Taylor, KNEO, Neosho MO. 417-451-5636.

Microtran table top tape degausser, handles 1"-2" tapes, $150/BO; mechanical tape timers, Lyrec & Seike/Spotmaster, new & used. M Crosby, 408-363-1646.

Pams Jingles reference tapes from the years of 1951-1976, avail from every radio market in the US, Canada & Europe, call after 3PM CST, 214-271-7625.

Want To Buy

MOR-Adult music libraries on CD or reel. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

Pre-recorded 2 trk, in-line or stagtgered heads, open reel tapes by RCA, Mercury, etc, including master dubs. P Chance, Imperial Analog, 925 Clinton St, Philadelphia PA 19107. 215-574-8147.

TAX DEDUCTIBLE

AM xmtr 50 kW, parts for ATV, parts for open wire transmission line, twr 200', tax deductible certificate issued for value. C Davidson, International Religous Society, POB 5051, Danville VA 24540-0118.

Non-profit bdctg organization seeks 2-5 kW xmtr & studio equip, fully tax deductible w/receipt at your own rate, we will pay for shpg. Serge, POB 9412, Bridgeport CT 06601. 800-522-8356.

TEST EQUIPMENT

Want To Sell

Sencore SG-165 AM/FM stereo analyzer, excel cond, w/manual & accessories, $500 +shpg; Stoddart NM-20 field intensity meter w/pwr supply, unknown cond, $100 +shpg; HP 350B attenuator set, 5 W - 600 ohm, missing one banana jack, $25; HP 200CDR wide range oscillator, $50 +shpg. L Spivey, WSNR, 1121 South Main, Hartford KY 42347. 502-298-3268.

Coaxial Dynamics 86526 50 ohm RF terminating load, DC to GHz 25,000 watts max power CW, water cooled via self-contained water to air exchanger & air blower, $1800/BO. Brian, Marion IA, 319-378-0866.

Want To Buy

Bird 43 wattmeter or similar, EBS encoder/decoder, 10x10 routing switcher or similar, mono. J Powley, 716-942-3000.

Potomac Instruments FIM 21's or FIM 41's in decent cond, will calibrate, no junk please, gd prices pd for gd units, fax desc, age, price to Bill Sacks 703-534-7884.

Revox B77 Mark II, hi-speed, 1/2 trk, excel cond, w/service manual & original packing, $950. M. Guarnere, Whats Real Unlimited, 25 Rundel Park, Rochester NY 14607. 716-256-2418.

TRANSMITTERS

Want To Sell

Collins 550A-1 500 W AM tube type xmtr, both 1070 & 860 crystals, manual, lots of parts, runs well, garage kept, as is you haul, $600. L Spivey, WSNR, 1121 South Main, Hartford KY 42347. 502-298-3268.

Harris FM20H3 20 kW FM xmtr, on air w/MX15 exciter, $15000. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

LPB RC 25B 25 W AM, $200; AEL 2.5 KD, 2500 W AEL, no exciter, tuned on your freq, $3000. J Gray, WCAK, 10 Trinity, Ft Thomas KY 41075. 606-781-5715.

Bext P10 programmable portable 12V 10W FM exciter, lw hrs, fact warr, $1495/BO. B Dougan, KAFR, 17818 N 5th St, Phoenix AZ 85022. 602-548-1054.

Continental 816R-4 27.5 kW FM xmtr, 13 yrs old, used as a standby for last 10 yrs, fine cond, looks good, good tubes & rebuilt gating cards, video avail, $25000. Mike Heilman, KQMQ-FM, 808-591-9369.

CSI FM exciter, 20W, frequency ajile, $1000. M Taylor, KNEO, Neosho MO. 417-451-5636.

Gate FM5B & 250B driver was used recently at power level of 4000 watts, capable of 5000 watts, good as main or backup, BO. M Powell, WBEY Radio, 410-968-9696.

Gates BCG-1 AM xmtr, 1000W, fully operational, great older xmtr. G Hearl, 540-964-7416.

RCA BTF 20E1 20 kW FM w/bandpass filter, exciter, 2 stereo gens & spare parts to trade for newer 1 kW to 5 kW FM xmtr, willing to split shpg costs for both rigs. C Freinwald, Seattle Radio Group, 1730 Minor Ave #200, Seattle WA 98101. 206-343-9700.

RCA BTA5F 5 kW AM xmtr excl cond, all manuals & floor layouts, ready for immediate shpg & loading costs. G Heidenfeldt, WRGH Radio, 2880 W Lake Rd, Wilson NY 14172. 716-751-6187.

TRANSMITTERS .WTS

25-kW FM McMartin BF-25K, very good condition, 1981-vintage, one owner, priced right. Chris at 816-628-5959.

New McMartin 20 W, BEM 8000 FM exciters, New McMartin TBM1005D FM relay/rebroadcast rcvrs, also some used McMartin B910 exciters 15W. Goodrich Enter., 11435 Manderson St., Omaha NE 68164. 402-493-1886 fax 402-493-6821

Used equipment for sale: Belar SCM-1, Belar RFA-1, Belar FMS-1, Belar FMM-1, Moseley MRC 1600 system, TFT EBS receiver/generator, Gentner patch panel, and Harris racks. Call Transcom Corporation 800-441-8454 or 215-884-0888.

TURNTABLES

Want To Sell

Ramko w/tonearms & cartridges, $150; Technics SL1200MK2, $350. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Technics SP-15 3 speed, w/tonearm, 3 avail. Kevin, 406-232-5626.

Technics SP25 hardly used, base & levelers incl, $250/BO. T Payne, KTMC, POB 848, McAlester OK 74502. 918-423-1400.

Want To Buy

SL-1200MKII (2), must be in gd cond, will pay for shpg. Jeff, 708-993-9250.

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: ______

*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

Want To Buy

Gates BC-5P AM xmtr in any condition. A Weiner, WEGP, 3 State St Place, Presque Isle, ME 04769. 207-764-4389.

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

TUBES

Want To Sell

4CX250B, 833C, 4-400, 3CX1500A7, 807, 4-125A, 4CX350A, 4-1000. EIMAC, AMPEREX, RCA. Westgate 800-213-4563.

For details on space availability contact Simone at 1-703-998-7600 Ext.154

HELP WANTED

RF Technician / Maintenance Engineer

WNYC AM/FM seeks a full-time RF technician to maintain it's FM and Directional AM transmitter sites. The successful candidate will also join a team of maintenance engineers to perform work on all broadcast audio equipment for the Station's production, on-air and master control rooms. Qualifications: 3-5 years hands-on experience in transmitter and broadcast audio equipment maintenance. BSEE or equivalent preferred. SBE Certification a plus. Valid NYS drivers license.If interested, please send resume to:

WNYC, HR Dept 25-RFT,
1 Centre St.
26th floor, NYC 10007.
EOE, M/F/D/V

Sales - Technical

Incentivized sales and technical support on new products from established manufacturer for broadcasting and cable TV. Excellent working environment in a fast-growing, high-tech company. Earn up to $100K annually, depending on skills and experience. Full employment benefits, 401(k) and bonus.

Send resume to:
ATTN: Human Resources
530 Lawrence Expressway
Suite 531
Sunnyvale, CA 94086

Sales Engineer Wanted

Aphex Systems, the leader in broadcast and pro audio signal processing, seeks a unique individual to fill its newly created Sales Engineer position. Duties include key account management, training, field applications and trade shows. Extensive travel, competitive compensation and benefits, and the chance to grow with an exciting company with proven technology. We are looking for a self-motivated, self-directed individual with a mix of strong technical chops, people skills and business savvy. Sound like you? Fax or mail your resume with a request for the Sales Engineer job description.

APHEX SYSTEMS
No phone calls please

Julie Garcia
11068 Randall Street
Sun Valley, CA 91352
Fax (818) 767-2641
Equal Opportunity Employer

Starlight Broadcasting Co. is seeking experienced Sales Manager for 5 station group in Kentucky. Competitive salary & benefits. Send resume to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box #96-10-30-1 RW.

POSITIONS WANTED

26 yr old w/FCC license seeks any position w/Washington DC stations, reside in Adelphi, MD. Call for audition tape or resume. Albert, 301-434-8914.

30 yrs exper in management, sales and production, lots of proven money-making ideas, work well with people, will relocate. Write to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box # 96-10-16-1 RW.

A better bottom line! I'm seeking opportunity to make a small market radio station in the SE successful. Many years in business, high integrity. Write POB 14706, Greenville SC 29610.

Board op/weekend on air seeking smililar position in Southern US, 2 yrs exper, demo tape upon request. Robert 405-323-4844 or 772-5939 (Sun).

Chief Engineer seeks FT position or contract work, Arizona only, 25 yr pro, all phases high pwr directional AM & FM, construction, applications, take charge organizer. Peter, 520-531-1053.

For details on space availability contact Simone at 1-703-998-7600 Ext.154

Grown-up announcer needs job in southeast. I know adult standards, played them when they were MOR. Call Alex, 513-777-8423.

Motivated broadcaster looking to get back into radio, PT, weekends, overnights, prefer southern Missouri. Bill, 417-882-2460.

Program Directors: looking for knowledgeable R&B DJ to host unique show & boost your bottom line? Call for free 1 hr audiotape, 1-718-528-9758.

Air Talent, News & Production announcer, 10 yrs exp, wants reentry as announcer after 15 yrs in eng. Alex, 513-777-8423.

Congenial adult bdctr would like to join adult or christian format small/medium mkt station. 17 yrs radio, 12 yrs muzak, Western states in clear air. EJ Puchalsky, 11 Tenn St119-E, Redlands CA 92373.

Enough talk, back to music, ex-KPIX announcer gives knowledge, experience & unique style for AA, AC, or AOR music, demo on call. Brian B, 415-255-7807.

Experienced station mgr, 40 yrs plus total, retired owner avail small or medium mkts, perfer GA or Southeast. Lew Banks, POB 2551, Newnan GA 30264. 770-254-1830.

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