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Radio World

Part VI of Ty Ford's
 Radio Spots Series
 See page 46.

Vol 20, No 2

Radio's Best Read Newspaper

January 24, 1996

DAB Field Tests Good to Go in San Francisco

by Lynn Meadows

SAN FRANCISCO Don't hold your breath, but the Digital Audio Broadcasting (DAB) field tests are slated to begin in less than two weeks.

The Electronic Industries Association (EIA) spent a hectic autumn and holiday season answering complaints and trying to ensure that Eureka-147 DAB gets to stay in the contest.

But things are looking up.

The National Telecommunications Information Administration (NTIA) and EIA signed an agreement to allow Eureka-147 to share the L-band spectrum it needs

for the field tests last month. And the EIA has addressed the complaints that resulted from the lab tests.

When the lab test results were released last August in Monterey, Calif., the EIA expected such a heated reaction from proponents that it did not allow the press to attend.

According to reports, the USA Digital Radio (USADR) system sounded so bad in one test that USADR engineers quickly set up the test with their own equipment and the sound quality they demonstrated was dramatically improved.

Protests ensued

Three proponents, Nikil Jayant of AT&T, Don Messer of VOA/JPL, and Bernee D.L. Strom of USADR sent the EIA a letter protesting the testing procedures used in the lab.

Specifically, the three complained about the power settings used for IBOC systems during the lab tests. Power settings that are too low cause static on

analog transmissions and make the recovery of bits difficult for digital systems.

The group was also frustrated by the receiver compatibility results from the NASA Lewis Research Center lab tests. They were "so at odds with the test experiences" of proponents, said the three, that they should be reviewed.

Meanwhile, many questioned if the EIA was favoring the Eureka system because Thomson Consumer Electronics is a member.

The EIA agreed to look at the laboratory data and invited USADR to measure the power levels used in the multipath tests. It also asked USADR to bring the analog compatibility receivers it used in demonstrations to the lab.

Retest results

"We closed the book disagreeing on the difference," said USADR Engineering Manager A.J. Vigil of the multipath levels. Vigil visited the lab with several other USADR players to determine what went wrong in the lab.

The EIA released a cryptic 12-page report on this second look at multipath power levels offering little explanation

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radio.sys
 From On Line to On Air
 See page 36

Candidates for NAB Seats Expound on Radio Issues

WASHINGTON Bill Poole offered "a chicken in every pot," and Gary Brobst promised "no new taxes."

Ballots for the NAB 1996 election are due Jan. 26, and RW did as thorough a polling as possible of the Radio Board member wannabes.

The light-hearted responses highlight the bizarre nature of the National Association of Broadcasters election. There is little or no campaigning, no debate and no mud-slinging. The elections reflect what an amiable business broadcasting is.

But a seat on the radio board is a big deal. The prestigious position gives a broadcaster a say in NAB activities and a chance to network and disseminate information back to the district.

Board members serve two-year terms with even and odd districts elections held alternative years. Members cannot serve more than two terms consecutively.

Absentee candidate

An interesting race is on in District 12, which covers Missouri and Kansas. John T. Lynch, president of Noble Broadcast Group, is running against incumbent Curt Brown, vice president and general manager of KTTS-AM-FM.

Asked what issues he thought are most pressing, Brown, like almost all candidates, mentioned the telecommunications bill calling it "one of the great turning

points of our industry."

Brown also speculated on the impact that satellite digital audio radio services (DARS) could have on a lot of small-town stations likening it to "the Wal-Mart of the radio world."

When RW asked Brown what he would like to see develop in the industry, Brown said he would want to hear more personality and more news mixed with music. He asked who would win the competition

for listeners: a music machine in the sky (DARS), or a station with 10 or 12 in a row music sweeps.



Big selection

Four candidates are running to represent the Mid-Atlantic region, District 4. They include William Poole, general manager of WFLS-AM-FM; David R. Roederer, vice president and general manager of WPSK-FM; E.B. Hawkins, station manager for WILM (AM); and Rick Mack, vice president and general manager of WBIG-FM.

With his involvement in state associations, Roederer said he would like to see the NAB offer more input and services to the states such as providing speakers and training.

Another one of his goals is to ascertain what the needs of small and medium sized markets are in the face of deregulation and other communications changes.

continued on page 11 ►

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NEWSWATCH

Pacific Bell Waiver

WASHINGTON Pacific Bell will offer free integrated services digital network (ISDN) telephone lines to 8,600 public and private schools, libraries and community colleges in California for one year.

The Federal Communications Commission granted a waiver of its rules and is allowing the company to provide the service without charging the interstate Subscriber Line Charges (SLC). In August 1994, the California Public Utilities Commission agreed to allow Pacific to provide ISDN to eligible institutions free of intrastate charges.

Pacific Bell's Education First promotion

will provide up to four ISDN lines to all eligible institutions in California.

Conferees Compromise

WASHINGTON The elaborate budget stalemate that gave federal workers a second forced vacation left members of Congress with time on their hands to reach a compromise on the telecommunications bill.

At press time, staffers were furiously working on the conference report for the telecommunications bill. Here is the expected breakdown subject to the approval of certain grumbling republicans:

Number of Ownership Limit per

Stations	Limit	Service
45	+8	5
30-44	7	4
15-29	6	4
1-14	5*	3

*Or 50% whichever comes first.

Charles Osgood Is Keynote Speaker

WASHINGTON Charles Osgood of CBS Radio's daily "The Osgood File" and CBS News Sunday Morning will keynote the National Association of Broadcasters Radio Luncheon to be held Tuesday, April 16.

When looking for a digital audio system for automation of satellite programming or live assist, there would appear to be many choices. But if you're looking for a system which is flexible enough to give you total control without sacrificing your sanity, there is only one choice. The Phantom by RDS.

You will see the difference as soon as you see the Phantom in action. The display provides you with all of the information you need to see in a clean, concise manner, without the crowded look that you'll find in other systems. If you are familiar with the most popular software on the PC, then you may already know how to use the Phantom. The Phantom's pull-down menus guide you through all of the steps involved in setup and daily operation, from creating and scheduling clocks to creating and editing logs.

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The Phantom can retime spots to fit them cleanly into a satellite break without inserting silence, overlapping, or running late. The Phantom



can create reports to keep you informed on a number of topics, from a list of expired spots to an analysis of potential mistakes in your log. The Phantom also maintains a history of system activity.

The Phantom has the features that others would want you to believe are theirs exclusively. The Phantom remains *completely* functional during recording, sensing relay closures and starting breaks as easily as it does when it is not recording. The Phantom can fill incomplete breaks with spots from a list you specify without ruining product separation.

While other systems tie your hands and limit your flexibility by only offering 3 or 4 inputs, the Phantom gives you 6 stereo inputs, using its AMX-84 solid state switcher, with the option of increasing the number of inputs to 14 or more. If your station is News/Talk, you know how important this can be.

The Phantom allows you to change the sampling rate, digital format, and stereo/mono settings at will to meet your needs for an individual spot. The Phantom offers a number of digital formats, including the new Dolby AC-2 format, as an option.

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"Charles Osgood epitomizes the best in professionalism, talent and creativity for broadcast news. Not to mention, he tells a great story and he is very popular with broadcasters," said John David, NAB senior vice president, Radio.

Radio Aahs Buying WJDM (AM)

ELIZABETH, N.J. Radio Aahs is buying the first station to move to the expanded band for \$10 million pending FCC approval.

WJDM(AM) owner John Quinn will stay on as general manager for at least five years and is being paid to consult for 10. The station was allowed to move to 1660 kHz because Elizabeth was the largest city in the country without nighttime service.

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Burglary, Then Fire Destroy Transmitter Site

by Bob Rusk

SALT LAKE CITY A fire that authorities said was set to cover up a burglary one week before Christmas at the "Sports Radio 570" KISN(AM) transmitter site, caused an estimated \$500,000 in damage and knocked the station off the air for several hours.

The blaze was spotted shortly before midnight Dec. 17, 1995, and took almost 90 minutes to contain.

The first arriving fire company reported the west end of the building was heavily engulfed with fire and smoke, and a second alarm was immediately called in. KISN Engineering Director Gary A. Smith was summoned to the scene when the transmitter failed.

Off the air

"I got a call on my Gentner VRC-2000 Remote Control telling me the station was off the air," said Smith. "I was at the transmitter within 10 minutes and found fire engines all over the place. Police and fire investigators discovered that the site was broken into and ransacked for anything that could be pawned."

The Salt Lake City Fire Department confirmed in a written statement that investigators found evidence the fire was intentionally set to cover up a burglary. DJ, an arson-sniffing dog, found evidence that accelerants were used to set and spread the fire. Additional evidence also suggested a burglary was committed.

The KISN 5 kW Collins Power Rock transmitter was operating when the blaze broke out but quickly became "toast," Smith said.

"It sucked in the high heat and smoke through the blowers." The transmitter



must be replaced.

When Smith was finally allowed to enter the building at 4 a.m., there was no electricity, so he relied on an emergency generator to power the 1950s-era RCA BTA-5G backup transmitter.

"It was severely smoke damaged and looked like it should not have been running," Smith stated.

"I turned off all of the circuit breakers and brought up the generator turning on just the breakers I needed till I got power. We held our breath, turned on the RCA transmitter and up it came at about 6 a.m.

"Even though it was covered with soot, it's only a 5,000 V supply and everything is spread out in it. The other transmitter had a 15,000 V supply and was tightly packed. It wouldn't come on. It just areed over."

Smith found creosote deposits "a quarter-inch deep" inside the Power Rock transmitter, and the white tile floor of the building was turned to a coal black color from the smoke. One-third of the building was totally destroyed.

"Had the fire taken anymore of the building, it would have consumed the transmitter room completely," added Smith. "Instead, the transmitter room is where all of the smoke was dumped."

Controlling the fire

Six fire engines, two ladder trucks, the Hazardous Materials team and 45 fire fighters were called to the scene. Because the building has a reinforced concrete roof, firefighters could not open up and cut vent holes into the structure. But they were able to break through the windows and enter the building at the middle, which proved to be crucial in uncovering the cause of the inferno.

Smith credited the station's Gentner box with providing critical information to investigators.

"The VRC-2000 continued to operate," he said. "The box was covered with soot

and tar, but it was still able to tell us what happened. A burnt telephone was hooked into the box and we extracted information that told us the exact time the fire hit the transmitter and shut it down. We got all of the alarm information. We were actually able to quiz the VRC-2000."

Gentner Communications, which is based in Salt Lake City, dispatched Operations Vice President Bill Gillman to the scene to help Smith get KISN back on the air.

"You can never take for granted the fact that somebody is out there ready to do it to you," Gillman said of the fire. "You have to have your systems well protected. And you must have a disaster recovery plan in place. Otherwise you'll be off the air, and it will cost you money."

"Every station needs to look at where their vulnerabilities are and what it would take in the event of a catastrophic fire to be back up and producing revenue."

KISN, owned by Trumper Communications, was scheduled to replace its Power Rock with a Nautel transmitter. "I placed my order after the factory closed on Dec. 20," said Smith. "Those are good people."

Fire crews remained on the scene throughout the night dousing hot spots and gathering evidence. Although the blaze was difficult to fight and temperatures were in the low 20s, there were no injuries in the fire. At press time, there were no suspects and no arrests had been made.

Jones Networks Taps Wegener for Upgrade

by Christopher Nicholson

ENGLEWOOD, Colo. Affiliates of Jones Satellite Networks' (JSN) in-house networks will be converting to a new digital/SCPC satellite system. Making the transition will be the U.S. Country, Adult Hit Radio, Soft Hits, Good Time Oldies, FM Lite and CD Country formats.

The new system, designed by Wegener Communications, will be implemented at approximately 1,000 affiliate radio stations and will take roughly 14 months to complete. The conversion is slated to begin in May of this year.

According to Eric M. Wiler, director of engineering for JSN, the switch is costing the company in excess of \$2.6 million. Wiler said Jones is doing the most extensive testing of gear that he has ever seen in order to ensure a smooth transition.

Once all of its affiliates are set up, Jones will convert each of its music formats to digital one at a time. The first format to make the digital switch will be CD Country.

Wiler noted that offering a digital system should help Jones pick up

more affiliates because of the improved audio quality and the growing amount of interest in the technology that has taken place since the advent of the compact disc. He said that Jones has always been progressive with technology and is excited that the company is the first major provider of 24 hour music formats to convert to the MPEG audio system.

Jones is purchasing Wegener's Addressable DR96Q QPSK SCPC digital audio receivers. Efficient quadrature phase shift keyed (QPSK) modulation is utilized to reduce the bandwidth required for digital transmissions. The receivers use the ISO/MPEG Layer 2 digital audio algorithm and feature extensive real-time diagnostics. The JSN receivers will be controlled through Wegener's Addressable Network Control System (ANCS).

Wiler said JSN selected Wegener "because of their strong technological leadership, years of experience producing solutions for the radio industry and a six-year track record with us."

Bob Placek, Wegener's president and CEO, said that the company is gratified by the recognition and confidence Jones has shown in selecting Wegener.

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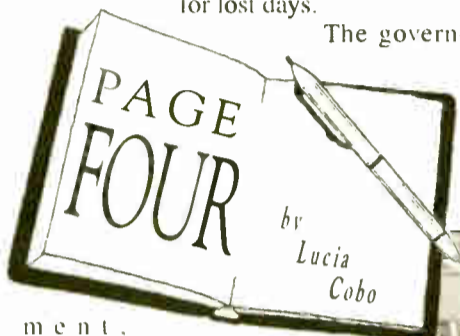
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Richmond Expo '95 Caters to Radio

WASHINGTON By now, you have all either heard about, read about, or experienced firsthand the Blizzard of '96. I'm writing this during Part 3, the day we got six more inches on top of the five from the other day after the day we got 24 inches.

As lovely as the snow is ... I'm ready for some greenery and sunshine. If you tried calling during Blizzard week, chances are you got the answering machine on all days but Thursday. It looks like we're at the tail end of the snow now, but we'll be working double time to make up for lost days.

The govern-



ment, which had been shut down due to the budget impasse, shut down again because of the snow. Schools, businesses and local government agencies are mostly all shut down for business.

Even if the government were open, there is no way to get into the District of Columbia as the roads that are open are impassable and the subway system (as it extends into the 'burbs) is frozen above ground and the buses just can't get around. As you can see, living at the hub of global power is as exciting as one could imagine.

And I realize that there are parts of this country that get much more snow than this on a regular basis, but this area is just not prepared for this flurried onslaught.

The upside is that at least it is not the vicious ice of two years ago.

★★★

Recently I visited with the nice folks at Harris Allied (now just Harris) in



Richmond, Ind. The reason for my trip was the company's second annual Richmond Expo. Thirty-seven exhibitors and 200 attendees made Richmond Expo '95 a success. Nearly double in size and duration as the '94 Expo, Expo '95, held Dec. 4-5, 1995, confirmed the need for a targeted, radio-specific trade show.

The company already is making plans for this year's Expo (to be held sometime around December.)

Its popularity with regional broadcasters (from as nearby as Ohio and from as

far away as West Virginia) stems from the heavy emphasis placed on service and maintenance training on the agenda. Geoff Mendenhall dissected the digital path, and Don Markely addressed AM/FM problems in general. Gerry LeBow from Sage Alerting talked about EAS and yours truly spoke on today's

headlines and their impact on you.

The smaller setting allowed for hands-on discussion and demos of company's best products with some of the top people in the business. Arrakis Systems' Jon Young and Mike Palmer, Gentner's Elaine Jones, Telos' Neil Glassman, Radio Systems' Dan Braverman, MUSI-CAM USA's David Lin, Comrex's Lynn Distler, Denon's Mark Kaltman, to name a few.

Comrex also used the show as a launching ground for its new codec, the Nexus ISDN Codec. Scheduled to begin shipping by the end of this month, the Nexus ISDN Coded features a built-in

Visitors packed the exhibit floor at the Clarion Leland Hotel in downtown Richmond, Ind., the site of Harris' Richmond Expo '95, where vendors demonstrated the latest in radio equipment.

terminal adapter, mic/line input, "turbo" G.722, setup with keypad, LCD display and memory dial, ancillary data capability, separate data port for SW56 DSU/CSUs, 15 kHz or 7.5 kHz low delay bi-directional mono audio, and the unit is compatible with other G.722 codecs.

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Mentor Remembered Fondly With Actions and Words

by Rob Branch

SAN MARCOS, Calif. I very much enjoyed the article in the Nov. 29, 1995, issue dealing with, "Is Radio Still Training Its Young Stars?"

It brings to my mind a similar issue: the people, such as Bob Gessner, who mentor those of us who have chosen this craft. Here is my experience in this regard and its results.

Icon

The year was 1954. I was 14 years old in Salt Lake City and knew radio was where I wanted to be. KALL 910 AM was the powerhouse then and Jack Whitaker, the omnipresence. His program, "Moon Dial," aired from 6 to 11 p.m., Monday through Friday, and was the highest rated show in the market. He was the icon. He was the one I wanted to work with and be like.

Through a lot of pestering on my part and some networking on my dad's part. I was finally introduced to Jack. He had only one question when I told him I wanted to get into radio: "Why?"

I told him radio was the most glamorous job I could think of — the money, the cars, the "chicks." My voice was no longer cracking. "I can do this!" I said. Jack listened and then very quickly forced me to adjust my thinking.

"Radio has a history. You have to understand and acknowledge that, along with the pioneers like Marconi, Tesla, Sarnoff, Morrow and Reed, radio is work. Nobody is an automatic entertainer. Money is a minimal reward. Adulation of the masses is an illusion. Radio is a dynamic and you have to be dynamic in order to succeed. It will love you as long as you love it."

I understood ... I thought. In any event, he

agreed to let me hang around and work with him.

As many evenings as I could, my starry-eyed presence would arrive at the feet of the master. Right after opening presents on Christmas, I was there. New Year's Eve, while my peers were experimenting with 3.2-percent beer, I was in the studio. My birthday was spent with Jack. When he was on a remote, I helped pull his records.

He showed me the KALL studio where the "Intermountain Network Orchestra" was housed during the golden age of radio. He taught me to slip-cue 16-inch vinyl ETs (electronic transcription), PSAs and tricks like listening in "cue" while being on the air.

He had me record (reel-to-reel) everything, and then he'd chop it to bits. "Are you planning on reading to me, or communicating with me? Do to again!"

"Smile when you speak — it can be heard!" He had me listen to Orson Welles' "War of the Worlds" to better understand the "Theater of the Mind" — how words are used to project visions.

He had me read ... uh, communicate Shakespeare and Chaucer so they were understandable. "Read everything, including the warranty with your toaster!" And I did.

Miles of tapes went through those machines, and a few tears were shed. He pushed and pushed hard.

At one point, he got the flu and was spending a lot of time in the bathroom. He gave me a trust — play the records and run the spots. I was never so happy to see a man sick! I never said a word on the air, but I was in the horseshoe, spinnin' the heavy hits! This was where I belonged!

A year passed. One evening Jack said it was time for me to move on. I was devastated. Where would I go next? How would I be taught? Who would teach me?

Jack pointed me to my path. "Get a well-rounded education; just knowing radio is not enough. Learn how to research your audience so you can relate with them. Listen. Never stop practicing." This was my first experience at separation anxiety, and it was scary, but Jack was right — it was time to move on. What a year it had been!

"Jack," I said, "I don't know how to pay you back for this."

"You don't owe me a thing," Jack replied. "Just remember as you're making your way up the ladder, look back over your shoulder. If you see a 14-year-old kid you can help, help him. That will pay me back."

Remember

During the ensuing 35 years in this beloved business, his request has been honored. Whether they were interns, "wannabes," co-workers or my students, all were afforded whatever help and encouragement I could give, and it was given willingly.

Every award or acclaim I've received has acknowledged Jack's tutelage. In kind, some of my "kids" have acknowledged my assistance.

It appears this is a shrinking group, the Gessners and the Whitakers and yes, even the Petersons and the Branches. Radio is

No Doubt About It

There is no doubt that the radio industry will benefit from the plethora of digital products and the alacrity with which new technology is evolving. More streamlined and cost-efficient operations, the capacity to manipulate, create and route audio and thus create digital services to offer the public and create lucrative new revenue streams is more than a glimmer in broadcasters' eyes.

As RW's *radio.sys* special report evinces, radio is squarely in the computer age and moving quickly forward.

Half of the continuing battle will be software development and the integration of new digital services into the hardware and daily routines.

But this should be no problem. Case in point is station automation software, a fledgling business five years ago, now a prevalent part of every station. Competitive music and news/talk stations find they almost cannot do without software packages that did not exist a short time ago:

- Live-assist programs that allow a talk show host to know everything about the listener waiting on the line. Name, address and various other demographics (as well as the topic the listener wants to talk about) all flash on a computer screen.

- Audio recording and editing on a PC- or Mac-based computer allows unlimited nondestructive edits and quadruples.

- Systems to automatically record and store satellite program material and integrate them into prepared broadcast schedules that may be programmed and ready weeks or months in advance.

- Software to keep track of traffic and billing, ad sales, station maintenance schedules that are often flexible enough to fit into any sized operation, from a small rural station, to a multistation duopoly/LMA and sometimes a national group.

Innovative programmers, with suggestions from their radio customers, are continually making it easier to broadcast high-quality programming with significant long-term savings.

Radio should seek to expand itself by finding ways to convert its already-demonstrated mastery of computer technology into new digital services for the consumer and business.

— RW

now more of a business than it was when Jack was working with me, and stations are less inclined to teach as they pursue the bigger numbers.

Yet, there are some of us still around. Each paying back our Jacks or Bobs; each of us remembering the people whose patience, understanding and tolerance helped us get where we wanted to be.

My advice: Remember your mentors and become one. The euphoria of seeing one of your kids make it beats the hell out of any plaque or up-rating you'll ever receive. Especially when that 14-year-old says thanks.

Thanks, Jack. I'm still trying to pay you back while realizing the debt will never be paid.

Border trouble

Dear RW,

In reference to *Earwaves* in the November 29, 1995, issue I would like to respond to the comment: "The world is moving past us and we are not doing a great job of moving forward at all."

I find it rather strange that the editor sees Eureka-147 as a "moot point in the United States" and wants NAB to make a quick decision in favor of in-band, on-channel.

Quite the contrary. The United States will not move forward at all unless it adopts Eureka-147, as the rest of the world is in the process of doing.

For starters, can you imagine the nightmare, both for manufacturers and consumers of car radios, of having to design and use car radios that work on both sides of our two major borders (Mexico and Canada having adopted Eureka-147)?

Carlos A. Altgelt
Melvindale, MI

More riding the rails

Dear RW,

I enjoyed reading your article

"KBOI(AM) Signal Riding the Rails" (RW, Nov. 29, 1995). It reminded me of the "Mighty 690" (XTRA) in Tijuana, Mexico, as told to me by my late father, Ron Oakley, who was a professional engineer.

In the late 1950s my dad was in the process of building "The Mighty 690" station and instructed the Spanish-speaking crew to install ground radials at the base of the tower. He left his crew and what he thought were clear, concise instructions on the installation of the radials on a Friday afternoon. He drove to our home in La Canada, Calif., just north of Los Angeles.

When he was driving back to Tijuana the following Monday, to his bewilderment, the station was loud and clear throughout the Los Angeles basin. Upon his arrival at the transmitter site, he discovered that his Spanish-speaking crew had installed one very large copper strap to one of the tracks of the Mexican railroad.

It was evident that my father's instructions in Spanish were not very clear. However, the signal was loud and clear throughout the West!

Larry E. Oakley
Great Basin Communications
Reno, NV

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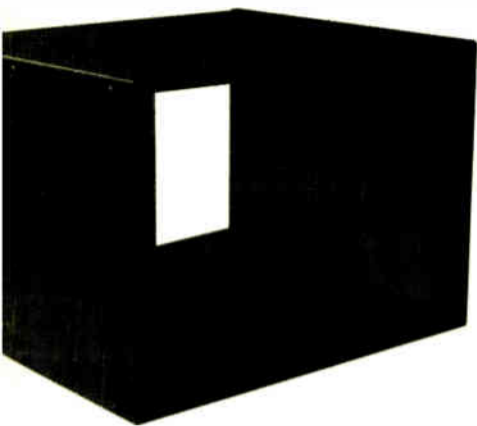


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February 7, 1996

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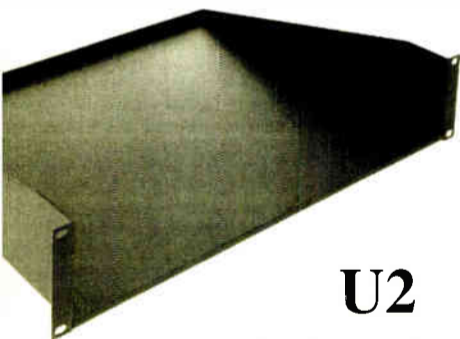
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Program Focuses on Local Involvement

by Frank Beacham

SAUSALITO, Calif. From a high-tech "electronic cottage" in rural northern California that links to more than three million people in 132 countries, Michael and Justine Toms, creators of "New Dimension" audio programming, have a daily pulse on the future of radio.

Though the Internet, "pay-per-listen" distribution, CD-ROMs and direct-to-home satellites figure prominently in their future, these veteran producers of spoken-word radio programming go back to a pre-electronic era when describing their work.

"Radio is the tradition of storytelling," said Justine. "We have learned from each others' stories since the beginning of language. We share stories around the campfire as our ancestors did. The only difference today is we sit in front of microphones that happen to go out on invisible radio waves. It's a magical medium."

Since 1980, Michael (as on-air host) and Justine (as producer) have been broadcasting New Dimensions on 250 public radio stations in the United States, on the Armed Forces Radio Network and on shortwave stations reaching more than 70 countries. As a listener-supported, non-profit education organization, New Dimensions also sells audio cassettes from a radio archive of over 2,000 recorded conversations, publishes a magazine and engages in workshops and the production of specialty audio programming.

Over the years, New Dimensions has carved a significant niche for itself. It is the only nationally distributed program that focuses on personal and social transformation. The show's guests — who have included such notables as Buckminster Fuller, Joseph Campbell and the Dalai Lama — address the dramatic cultural shifts and changing human values in society. Its focus on the human consciousness movement has created a treasure-trove of historical information.

As information entrepreneurs of the 90s, the Toms (they are husband and wife) see major change ahead in radio broadcasting due to new technological developments that allow specific programs to be addressed to specific listeners.

"Traditional radio will change radically because local stations are going to have to be able to compete with everything else that's coming down," said Michael. "The way they can compete is to become more local and more connected to the community they serve."

Bypassing the "gatekeepers" of traditional radio broadcasting and getting directly to the listener is a key goal of New Dimensions.

"A lot of people are interested in audio they can't hear on the radio," Michael said. "People are discovering they can create their own commercial-free programming with just cassettes. The new technologies allow people to hear their programming when they want it."

In addition to its current worldwide broadcast distribution, New Dimensions is using several new technologies, including the World Wide Web, pay-per-listen services and CD-ROMs to expand its listenership.

"We see the Internet as a 24-hour-a-day radio station extension. A radio station

without a transmitter," said Michael.

New Dimensions just opened its web site (<http://www.newdimensions.org>).

"It's still a walk up the hill," Justine said. RealAudio technology will be added in early 1996 to allow the real time playback of programming on demand. Much of the content, however, will remain free to listeners.



Justine Toms & Michael Toms

"People are used to having audio for free. It's the way we've all come up," said Justine. "We expect to provide quite a bit of free material on the Net in hopes that people will want to (purchase) other material that is not available for free."

For example, said Michael, "If we do a series of programs on new business paradigms, we might play one for free on the Internet and have the rest of the series available for purchase."

New Dimensions is working with Cupertino, Calif., startup Information Highway Media Corp. on the test of a new audio-on-demand subscription service called "Listen Up."

The new service will use cable television systems to download audio programming to a portable digital storage device that allows listening at anytime, anywhere. (See the related column, Signal-to-Noise, page 31 of this issue.)

"This is the concept of addressability ... the ability to capture individual households," said Michael. "That hasn't been possible up until now. We will be able to put out information over the electronic airwaves and reach small numbers of people in a commercially viable way."

They are also exploring the possibilities of CD-ROMs.

"We have over 5,000 hours of material from the radio program," said Michael. "Much of it is timeless with archival value. There are tapes with people who have become more famous in death than they were in life. This kind of audio can be coupled together with visuals to produce effective educational and commercial material on CD-ROM."

Other potential new areas of distribution include informational audio channels on direct-to-home TV satellite services, digital satellite radio and audio tape subscriptions by mail (just begun at a cost of \$300 per year).

"We want to make our audio information available in whatever form, through whatever technology is available," said Justine. "Radio will always be around but it will change when people can program their own commute time."

A recent New Dimensions guest, Nicholas Negroponte, founder of the Media Lab at the Massachusetts Institute of Technology, helped Michael Toms refocus on his audio roots.

"He said the future of audio is bright because people have a lot more ear-time than they have eye-time," Michael said. "When you think about it, it's so true. No matter which technology we use in the future, we are basically committed to sound and the aural tradition."

New Dimensions is located at P.O. Box 410510, San Francisco, CA 94141; 415-563-8899.

CPB Reports Flat Income

WASHINGTON Income for the public broadcasting industry has remained flat since 1992, according to the Corporation for Public Broadcasting (CPB).

The annual financial report for 1994 showed television and radio income totalled \$1.79 billion — almost no change over 1992.

Private donations made up the largest portion of television and radio income for the past seven years. Non-federal income accounted for 82 percent of the industry's income for 1994 — 3 percent increase over 1993.

While public television revenues barely changed between 1993 and 1994, public radio income increased by 0.5 percent to \$411 million in 1994.

Business contributions to radio — mostly from in-kind donations — increased 10 percent and totaled over \$76 million. Business contributions to television increased only 4 percent but totaled \$225 million.

In 1994, 6.4 million people contributed to public broadcasting with 4.5 million giving to television and 1.6 million to radio. Individual donations accounted for 24.6 percent or \$101 million of radio's total 1994 income. That was a growth of 8.6 percent over 1993. Individual donations to television stations grew by only 0.2 percent.

Gains from some income sources were met with declines from others. State governments increased their contributions by \$17.3 million and business contributions were up by \$15.9 million. Federal grants, however, fell \$61.2 million. The congressional appropriation for CPB rose \$21.7 million in 1994.

Meanwhile, the CPB is funding four new ventures to launch this fall. Four stations will receive strategic business development consultation. The consultation is designed to help them create new income, incorporate advances in telecommunications, increase efficiency and reduce dependency on federal funds.

WHYY-FM in Philadelphia, home of "Fresh Air with Terry Gross," will start a book club based on guests and books featured on the show. Other ventures include a commercial Web service provider in Norfolk, Va., a teleconferencing service for citizens and businesses in rural west-central Illinois, and a Center for Professional Development in Los Angeles that will offer training for teachers and private industry.

CPB will provide each of the selected stations with the services of a business development consulting team as well as a public television adviser who has been successful in entrepreneurial activities.

INTERNATIONAL UPDATE

RDS Forum Debates DPGS Standards

by Bev Marks

TURIN, Italy The RDS Forum, held Dec. 4-5, 1995, in Turin, was forced to a vote when the introduction of Open Data Applications (ODA) was considered for inclusion in the next edition of the RDS standard CENELEC EN 50067.

No particular system, however, was specified after a lengthy and lively debate.

The meeting was organized with plenary sessions to discuss the activities of a number of working groups established at the last RDS meeting held in April 1995 in Philadelphia.

During the summer, two working groups developed proposals for a future RDS standard. The first group, WG2/3, studied the development of Emergency Warning Systems (EWS), DAB cross-referencing and Open Data Applications for inclusion into the standard.

The second group, WG6, handled most of the drafting work associated with this revision that had to consider harmonization with the RBDS standard used in the United States, as well as to ensure full backwards compatibility.

WG2/3 looked for information in the United States — where EWS is probably at the most developed stage — and incorporated all proposals with one exception where backward compatibility was not satisfied. This was accepted with no further comment.

DAB cross-referencing was reported to require further work. This will be the liaison subject between members of WG2/3 and those of the "Services Module" of the EuroDAB Forum.

Open Data Applications produced a very lively debate. Members of WG2/3 gave detailed explanations of the ODA concept and its origins.

ODA was developed to allow future data applications to be incorporated into RDS transmissions, even though an analysis of available data groups suggests that virtually no more groups are available for data applications. Furthermore, new data applications were registered and brought into commercial use without the delays that the standardization process inevitably brings.

Thus, a highly flexible proposal for ODA was presented that allows even very-low-data-rate applications or short-duration data applications, say two hours per day, to share RDS transmissions multiplexed over the 24-hour period.

WG2/3 also discussed a proposal from the Landesvermessungsamt (state surveying agency) of North Rhein-Westphalia, Germany, for an Open DGPS standard to be developed and included in the updated RDS standard.

While this proposal was given a brief explanation, it was clear that there was some opposition to including it in the new standard given the already widespread commercial DGPS services in a number of countries.

Therefore, it was decided to take this problem to the RDS Forum plenary session, and Chairman Johnny Beerling agreed to a short notice agenda change to ensure a fair discussion on the subject.

The essence of the debate focused on the difficulties that would arise if Open DGPS were standardized as part of the RDS standard: It would place other DGPS systems

would be at a disadvantage. The DCI/Teracom DGPS applications in Sweden and other nations was cited as being at risk if Open DGPS became the only standardized DGPS system. However, Teracom said it would be happy to align its system into the proposed ODA.

At the forum, it also was announced that another DGPS system was being developed in Norway.

Finally, the chairman asked the meeting to vote on the matter — a very unusual request. The outcome was that no particular DGPS system should be favored and all could apply for ODA registration.

The flexibility and impartiality of the ODA proposal now is confirmed and the

WG2/3 will be briefed by the RDS Forum to complete its work in early 1996. (Table 1 shows RDS groups potentially available for ODA.)

The ODA registration process will be managed by the RDS Open Data

Table 1. GROUP TYPE AVAILABILITY FOR OPEN DATA APPLICATIONS

5A	Available when not used for TDC
5B	Available when not used for TDC
6A	Available when not used for IH
6B	Available when not identified as IH by type 1A group (Variant 6)
7A	Available when not identified as RP by type 1A group (Variant 2)

Applications Office to be set up at EBU in Geneva, Switzerland.

Delegates from the United States and non-European countries agreed that a single office was the only way to maintain an effective single database of registered applications.

The RDS Forum will publicize the ODA registration process through sister organizations such as ABU and NAB once the new standard is ready.

7B	Available unconditionally
8A	Available when not identified as TMC by type 1A group (Variant 1)
8B	Available when not identified as TMC by type 1A group (Variant 1)
9A	Available when not identified as EWS by type 1A group (Variant 7)
9B	Available when not identified as EWS by type 1A group (Variant 7)
10A	Available unconditionally
10B	Available unconditionally

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NRB to Address Future of Industry

by Christopher Nicholson

INDIANAPOLIS Broadcasters at the National Religious Broadcasters Convention & Exhibition (NRB 96), Feb. 3-6, in Indianapolis will have an opportunity to focus on new and upcoming technologies in radio.

More than 5,000 people are expected to attend the 53rd annual NRB that will take place at the Indiana Convention Center.

The overall theme, "Running the Race," reflects Indianapolis' well-known racing events as well as what religious broadcasters have been doing for 75 years, according to NRB Vice President Michael Glenn. Headlining speakers at NRB 96

will be former Vice President Dan Quayle and Senate Chaplain Lloyd Ogilvie.

Among the sessions, "Emerging Technologies for Radio" will look at the future of the industry and will be highlighted by speakers from areas such as DAB, digital devices for broadcasting production, the Internet and other tools of communication. A video presentation of an in-band, on-channel (IBOC) system also will be featured. Jim Sanders of Ambassador Advertising Agency will moderate the session.

"From Live Radio by Phone in the 30s, Reel Tape in the 50s, Cassettes in the 70s, Satellite in the 80s to Digital in the

90s" will cover satellite program downloading and control room digital workstations. Paul Hollinger, general manager of WDAC-FM, will moderate discussions on key points such as equipment, features and costs. Demonstrations of Air Force

More than 5,000 people are expected to attend the 53rd annual NRB.

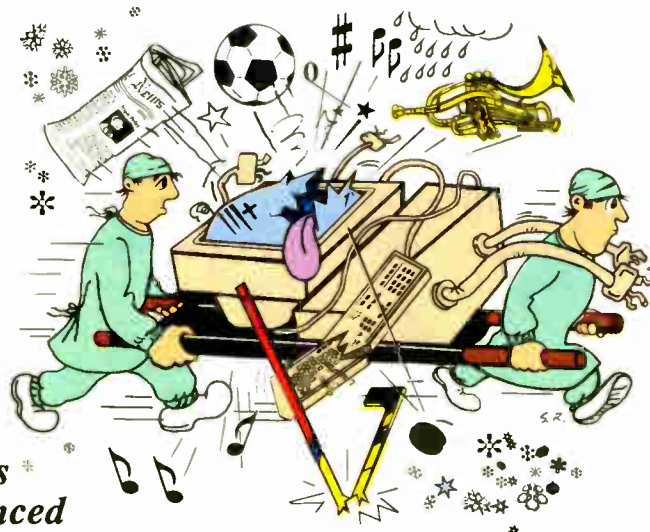
by Crown, Wizard by Harris, AudioVault by Broadcast Electronics and Digilink by Arrakis also will take place.

A demonstration of a digital highway program delivery system is planned for "Technology and the Radio Program Director."

The session, moderated by Martin Jones, manager of Good Life Associates, will focus on how the digital highway will impact program delivery and how to be ready for it; what digital systems to look at and questions to ask before buying; creative uses of existing technology as well as the positive and negative aspects of telecommuting technology.

More than 35 other sessions focusing on numerous aspects of the broadcasting industry will also be offered. In addition, more than 170 companies are expected to be represented at the NRB 96 Media Exposition (See related article below.)

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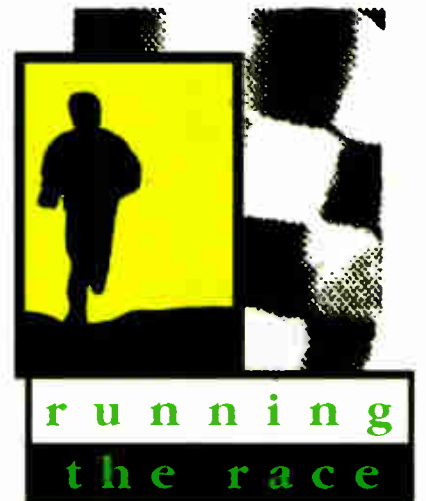


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NRB '96 Indianapolis

NRB to Show Emerging Technology

by Christopher Nicholson

INDIANAPOLIS With more and more radio stations switching to digital editing, live assist and automation tools, digital equipment will make a strong showing at the 1996 National Religious Broadcasters Convention and Exhibition (NRB 96), Feb. 4-6, in Indianapolis.

The Indiana Convention Center will play host to NRB 96, where representatives from more than 170 companies will occupy 80,000 square feet of exhibit space. Virtually every aspect of the industry will be represented at the NRB Media Exposition, which sold out in the summer.

The NRB show is where some companies preview their latest developments before officially introducing them at the spring National Association of Broadcasters (NAB) convention.

Among the companies that will display and demonstrate the latest digital systems are Radio Systems, Arrakis, ABG (Roland Pro Audio), Crown, Harris (VoxPro), Broadcast Electronics and Micro Technology Unlimited. These systems will complement and illustrate discussions that will take place in a number of NRB 96 sessions focusing on

continued on page 11

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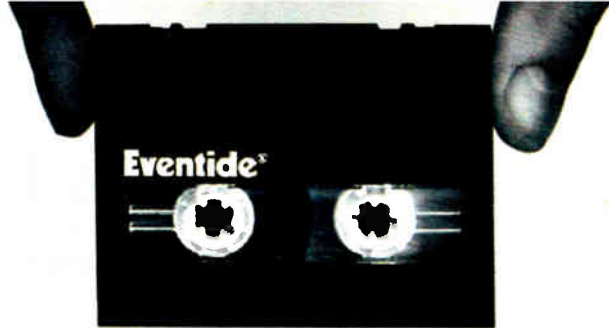
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Radio Board Candidates Discuss Issues

► continued from page 1

mer. "The goods are very damaged in radio in America," he said. Hawkins said that at his station, all advertisers pay the same price and that WILM has "a sales department that is not competitive."

WILM also has 26 newspeople to provide around-the-clock coverage. According to Hawkins, the station does very well.

"We have a bright and brilliant future if we can just flip the mirror around a couple hours a week and think past today's sale," he said. He said he would like to show by example that you can charge everybody the same rate and tell everybody the truth every time.

Poole has been with WFLS-FM in Fredericksburg, Va., for 36 years. During that time, he has been active in the Virginia Association of Broadcasters and worked on the NAB legislative liaison committee.

Like Roederer, Poole said he has concerns about the future in small and medium markets. Although he has some reservations about lifting ownership caps, he said, "I think it's important that we don't end up being the only totally regulated industry."

The first amendment is another key issue for Poole. He said he does not like restraints on broadcasters that do not affect their competition.

New York, New Jersey

One candidate withdrew from the District 2 elections. The salty Andrew A. Langston, CEO and general manager of WDKX-FM in Rochester, N.Y., said he did not have the time.

That leaves Randall D. Bongarten, president and general manager of

WAXQ(FM), David S. Gingold, president and COO of WHLI(AM) and WKJY(FM) and William O'Shaughnessy, president of WVOX(AM) and WRTN(FM).

Bongarten has been a member of both

Election results will be announced on February 2.

the New Jersey Broadcasters and the New York State Broadcasters Associations and served on the board of directors for the Radio Advertising Bureau (RAB). He cited the telecommunications bill, legislation concerning beer and wine ads, first amendment protection and performance rights legislation as issues in which he is especially interested.

Not only should the NAB be concerned with the telecommunications bill, he said, but also with "preserving and enhancing radio's place" in the entire communications structure.

O'Shaughnessy's has served on the radio board. During his nearly 10 years, he chaired a committee and led the charge to merge with the National Radio Broadcasters Association (NRBA).

"Sales is the missing dimension in NAB's service to its members," O'Shaughnessy said. He would like to see the RAB merge with the NAB.

O'Shaughnessy also wants to protect First Amendment rights. In one radio board meeting he attended, the board wanted to censure Howard Stern. According to O'Shaughnessy, he alerted Mel Karmazin at Infinity who threatened to pull all of his stations out of the NAB. O'Shaughnessy won the votes needed to oppose the censure.

Louisiana, Mississippi

Three candidates are running for the radio board seat in District 8: Stephen C. Davenport, president of WKXG(AM) and WYMX(FM), Bill Hickman, president and general manager of WMFM(FM), and Judy Karst-Campbell, president of KRRV-AM-FM.

One of the issues Davenport watches closely is the attempt by Congress to restrict advertising of products like beer and wine. Other issues he talked about were the continual raising of FCC license fees and taxation of advertising.

Asked how he would like to see the industry change, Davenport said like many broadcasters, he wishes something could be done in AM radio.

For his part, Hickman said that broadcasters have led the way for new technologies, and the NAB has to be there to watch out for radio's interests as they develop.

Deregulation is good for the radio industry, Hickman said, but the industry needs to be mindful of small market local broadcasters. He added that he hopes to encourage more membership, more participation and be a "conduit for input" to the national board.

Iowa, Wisconsin

Four candidates are running in District 14. Mark Hedberg, vice president and general manager of KRIB(AM) and KLSS-FM, J.D. Lumanog, general manager of KRNL-FM, Mary Quass, president of KTOF(AM) and KDAT-FM all are with

stations in Iowa. Thomas A. Walker, treasurer of the Mid-West Family Broadcast Group is the Wisconsinite in the batch.

Quass, a member and former president of the Iowa Broadcasters Association, said this is one of the most exciting and scary times for radio. She said her first love was radio, and she wants to help it make the transition to the 21st century.

Walker, who has a financial and legal background in addition to broadcasting, said that the complete lifting of ownership caps "is just not appropriate" at this time. He added that the per-market breakdown was a move in the right direction.

According to Walker, he has no agenda other than to serve the industry that has served him well. He emphasized that this interest was part of his group's commitment to the industry.

As far as what is ahead, Walker said he wants to ensure that radio "doesn't get lost" in telephone and television. He added that small independents are going to have to come to grips with duopolies. He wants the NAB and RAB to help them cope with the resulting management challenges.

Don't forget to vote

In District 6, Gary "no-new taxes" Brobst, vice president and general manager of WSOC-FM and WSSS(FM), is running against William McElveen, president and general manager of WTCB(FM), WOMG-FM and WISW.

In District 10, representing Indiana, Steve Avellone, vice president and general manager of WFWI-FM, is running against incumbent Kenneth S. Coe, president and general manager of WLOI(AM) and WCOE(FM).

Avellone, who has been in broadcasting for 21 years, sees the telecommunications bill, digital broadcasting and indecency as key issues this year.

Since he started as a DJ and worked his way up to owner, Avellone is in a position to lament that the farther up the ladder one goes, the farther away from broadcasting one gets. He said he'd also like to see

more grassroots training of students in broadcasting.

Coe started in radio in 1953, has served on the Indiana Broadcasters Association and also has been president of the Broadcast Pioneers Foundation Inc.

Farther west, in District 24, Gene A. Pietragallo Jr., general manager of KPSL(AM), is running against incumbent Howard B. Anderson, president of KHWH Inc. Anderson is vice chairman of the radio board.

District 24 encompasses Southern California, Guam, American Samoa and Hawaii. Anderson pointed out that it is market size rather than geography that determines what issues are most important to broadcasters.

In California, however, there are many Hispanic broadcasters so Anderson pushed to get more public service announcements delivered in Spanish.

First of Anderson's goals is passage of the telecommunications bill. He said he would also like to see in-band on-channel (IBOC) digital broadcasting get through.

Of those who say deregulation could hurt many single station owners, Anderson said, "They may be absolutely right, but the horse is already three miles down the road. He's gone." Anderson added that the current caps per market seemed "workable and livable."

No contest

Four candidates have the luxury of running unopposed this year. Barring any unforeseen developments, Dick Maynard, owner and general manager of KEKB(FM) and KBKL(FM), will represent Colorado and Nebraska; John W. Barger, president and general manager of KRIO-FM, will represent South Texas; Larry Roberts, president of Sunbrook Communications, will represent Montana, Idaho and Wyoming; and Jeff Lyon, general manager of KSNM(FM), will hold the seat for Arizona, Nevada, New Mexico and Utah.

Ballots are due by Jan. 26 and will be counted the next day. Election results will be announced on Feb. 2 unless there is a runoff. Ballots for runoffs will be mailed Feb. 23 if necessary.

Emerging Technology

► continued from page 8

emerging technologies in radio.

Advancements are also taking place in traffic and billing technology. Custom Business Systems Inc. (CBSI) will demonstrate its new traffic and billing software Premier. The software includes copy rotation where hundreds of rotation plans can be created for a contract, flexible order entry, user-defined contract confirmations and interactive manuals.

Look for antenna displays from Shively Labs and ABG (Jampro). Shively Labs will have its new low-power broadband FM antenna, among others, on exhibit. Mixers and consoles also will be featured from such companies as ABG (Mackie), Radio Systems and ATI.

In addition to Digit, Register Data Systems automation, Instant Replay by 360, and Gentner telephone talk and remote control equipment, Harris also will display a select group of late model used equipment.

Exhibits will be open Feb. 4, 1 p.m.-6 p.m.; Feb. 5, 9:30 a.m.-6 p.m.; and Feb. 6, 9:30 a.m.-4 p.m. An Exposition only pass good for the entire show is available for \$30. ☉

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Stations Challenge ASCAP Licensing

CAMARILLO, Calif. This could be the year the Goliath ASCAP is felled by the David that is the NRBMLC.

The two have a date in rate court this September to end a decade-old dispute over per program licenses.

The National Religious Broadcasters' Music License Committee (NRBMLC) began its campaign for a per program license in the mid-1980s. The committee does not believe the current per program license is fair to stations that use very little music.

Lobbying effort

Last fall, the NRBMLC began a strong push to get more stations to agree to be represented by them in negotiations with ASCAP. According to Russ Hauth, executive director of the NRBMLC, the media campaign was successful and 590 stations signed an agreement to have the NRBMLC represent them.

"By law, ASCAP is supposed to provide an economically viable alternative to its blanket license," Hauth said. "Yet, ASCAP has repeatedly refused to do so and stations that do not use a lot of copyrighted music are grossly overcharged."

Hauth estimated that between 25 and 30 percent of those who were allied with the NRBMLC were non-religious stations. Several stations with classical, talk, and ethnic formats are interested in a new per program license.

ASCAP was allowing stations to rescind their extensions if they chose to sign on with the NRBMLC. Stations also have the option to sign with the Radio Music License Committee to negotiate their licenses.

"Only the NRB Music License Committee is completely focused on getting a fair per-program license for stations that don't use a lot of licensed music," said Ed Atsinger, chairman of the NRBMLC and president of Salem Communications.

Interim license

At press time, the two sides were trying to reach an agreement on an interim license to bridge the gap until the final license is negotiated. Hauth said he expected the negotiations to last for several months. If no agreement is reached, the NRBMLC will wrap the current negotiations for the years

1996 to 2000 into the rate court hearing this fall.

The NRBMLC is hoping that a prior rate court decision on per program licenses for television will set a good precedent for their case. Hauth said the per program license that came out of "Buffalo Broadcasting v. ASCAP" is similar to what the NRBMLC seeks for radio.

If the rate court decides that the per program licenses from the past two license periods are unfair, ASCAP could wind up paying retroactive adjustments.

A secondary assault is being launched against ASCAP and other music licensing companies in Congress. The NRBMLC is

pushing heavily for "The Fairness in Music Licensing Act" introduced by Sen. Hank Brown (R-Colo.) and Rep. James Sensenbrenner (R-Wis.) in the House.

The bills would exempt businesses like restaurants and beauty parlors from making payments to music licensing companies for radio and television broadcasts of incidental music. The bills would also require music licensing companies to make their repertoires available so stations could easily see who controls rights to the music played. Lastly, they would give access to arbitration to music users who want to resolve disputes outside of the expensive rate court in New York.

ASCAP could wind up paying retroactive adjustments.

DAB Field Tests to Start

► continued from page 1
 of the figures within.

According to Vigil, the EIA did agree that the power levels were low. But the two disagreed on how low. USADR said the power level fell between five and 11 decibels shy of power while the EIA's figures ranged from two-and-a-half to six-and-a-half decibels shy.

"To their credit, it's not an easy job to measure the power levels," Vigil said. For now, the two sides appear to have agreed to disagree.

Others note that the fuss about multipath obscured the deeper problem of adjacent channel and second adjacent channel interference caused by IBOC systems.

Next, USADR and the EIA looked at what went wrong with the host compatibility tests. These were the tests designed to see how the IBOC system worked with an analog signal.

"There apparently is a host compatibility situation," said Vigil. It is infrequent, he added. The situation arises when there is a quiet program, little or no processing, stereo only, and the volume is turned up during a silent passage. It appears when using a "marginally designed receiver," said Vigil.

According to Vigil, the EIA will be able to

solve the problem by warning manufacturers to either put a 99 kHz low pass filter on FM composite between the FM demodulator and the stereo decoder or use harmonic cancellation circuitry on the stereo decoder.

"They pretty much admitted that programming material would mask the noise," said Vigil of the people in the lab.

But the lab tests are just the starting point for evaluation, some note. The real test comes in the field.

System changes

Last June, Eureka-147 informed the EIA that its system was meant to operate on a Single Frequency Network with two transmitters. The other proponents had already approved of using just one on Mt. Beacon.

"Any use of another major L-band transmitter in the San Francisco area operating in synchronism with the Mt. Beacon site should be considered a demonstration only, and no data should be gathered and/or recorded," they wrote. "The alternative is to open up the field test process to system changes from other proponents."

And that is what the EIA did. The first round of field tests is scheduled to begin in February. Original systems from all the proponents will be tested as well as any modifications they turn in by the Jan. 31 deadline.

At press time, USA Digital Radio, the most vocal opponent of the Eureka change, was close-mouthed about whether or not it would modify its systems for the first round.

A second round will follow in May with system modifications proponents turned in by April 30. The Eureka system, with both one and two transmitters, is ready for Feb. 1. In the most recent bombshell, Eureka — to the chagrin of some other proponents — has said it will not pay for the second round of testing.

Still Milford Smith, vice president of radio engineering at Greater Media and chairman of the DAB Report Writing Working Group is optimistic that all the problems can be worked out.

Smith said many of the major issues have been resolved and the minor ones are being addressed. His group is working on the framework for a draft report.

"The tests I think are very much on track," said Smith — albeit running a little slower than everyone might have hoped.

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World Radio History

First Frequency Swap Quiets Interference

by Bob Rusk

CARLSBAD, Calif. The first known frequency swap between radio stations in the United States and Mexico, which took seven years to complete, is being called a success for both countries.

KKOS-FM licensed to Carlsbad in San Diego County broadcast at 95.9 MHz with a tremendous amount of interference from Mexican station XHKY-FM (95.7 MHz) in Tijuana. In 1988, KKOS owner Jeffrey Chandler approached Victor Diaz, president of XHKY licensee Califormula Inc., to discuss ways to remedy the situation.

He estimated the value of the station increased from \$3 million to nearly \$20 million.

"There were several contentious meetings between Diaz and myself," said Chandler. "Then we sat down and talked about the possibility of getting new frequencies. We wondered if we could get upgrades from our respective governments.

"We came up with a plan that worked for both Mexico and the United States. It involved five frequency switches and was incorporated into the 1992 Mexican/American Broadcast Treaty."

Five frequency switches

As a result, KKOS moved to 95.7 MHz, changing call letters to KUPR and raising power from 3 kW to the equivalent of 25 kW ERP (with an increase in antenna elevation). In the deal, the old KKOS frequency (95.9 MHz) was moved to Ensenada, Mexico. XHKY, meanwhile, moved from 95.7 MHz to 99.3 MHz and increased power from 3 kW to 25 kW.

Diaz said XHKY, which broadcasts traditional Mexican music, benefited "incredibly" from the switch.

"From a local Tijuana station, we became a regional Southern California station," he continued. "We have an '800' number and get calls daily from the San Fernando Valley (north of Los Angeles). The improvement of the signal was fantastic. We could never have dreamed of anything better."

XHKY's transmitter, tower and studios are in Tijuana, with a U.S. sales office in Chula Vista, Calif., a San Diego suburb. XHKY's new frequency was taken from Tecate, Mexico. Tecate was granted 95.3 MHz as a replacement allocation but with a higher class of operation.

Additionally, Chandler paid to have KDHI-FM (95.7 MHz) in Twenty-nine Palms, Calif., lower its power to 6 kW and move to 96.3 MHz. KDHI's proposed frequency change is now before the FCC, but the station already lowered power from 16 kW to 6 kW on 95.7 MHz, which permitted KUPR to upgrade.

Chandler stressed that the money he spent was part of his plan to make KUPR a more valuable property. He estimated the value of the station increased from \$3 million to nearly \$20 million. Chandler

bought the station, which was bankrupt for just \$73,000.

On September 15, 1995, 20 years to the day after his purchase, the station moved from 95.9 MHz playing "America the Beautiful" by Ray Charles. With the switch to the new frequency and call letters, the station came on with a 15 minute montage of its AAA format (adult album alternative). Artists such as Hootie & the Blowfish and Sheryl Crow are played.

Antenna more

The antenna for the station was moved from northern San Diego County to the geographic center of the region at Mount Soledad — which Chandler called "the site of choice for four TV stations and eight other FM stations." From this location, the station can reach over two million listeners, compared to just 400,000 at the previous site. Moving to Mount Soledad,

however, was not without complications.

"Mount Soledad is too far from the city of license to offer 70 dBu coverage with conventional F(50, 50) calculations," explained Bob Gonsett, president of Communications General Corp. and KUPR's consulting engineer.

"So we had to rely on the supplemental Longley-Rice method of diffraction calculation. It shows that because the terrain is unusually favorable, with the signal shooting out over the Pacific Ocean, the 70 dBu contour actually goes farther than the conventional F(50,50) curves would predict. With that method of calculation, KUPR does cover its city of license."

Gonsett, who engineered the switch for KUPR from the start, said, "this was the first swap involving operating stations in the United States and Mexico that I have heard of. Extensive engineering work was required."

He predicted that KUPR will probably upgrade someday to limited Class B with a directional antenna to protect stations in Mexico. With XHKY's successful move from a Class A minus to a Class B1, Gonsett said this "may start a trend in Mexican broadcasting, where stations are dropped in on second adjacent channels, as was the case here."

Idyllic location

When KUPR moved its tower location, studios remained in the picturesque waterfront surroundings at Buena Vista Lagoon in Carlsbad. A patio facing the lagoon is the spot for Back Porch Concerts where the station invites 75 listeners twice a month. Jude Cole and Patty Larkin are among the progressive singers who have performed.

"The concert usually starts at 4:30 with an opening act," said Program Director Sherman Cohen. "The main act goes on at 5 p.m. We record the concert on DAT

and play it back on the air at 8 that evening."

The laid-back environment created by station owner Chandler has earned KUPR the nickname, the "Radio Resort." It's one of the reasons most of his employees have been with the station for more than eight years.

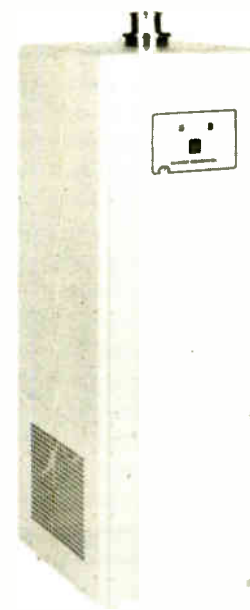
In his office, Chandler took a moment to reflect on the ground-breaking transaction he initiated that has brought him a new frequency and stronger signal.

"Our listening audience has increased by about 125 percent," he stated. "The cume is going up by about 15 percent a week. We're extremely gratified with that. Advertising revenues have not increased anywhere near 125 percent, but they've increased substantially."

"A 24-time return on your money is not too bad," he said with a smile.

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WORKBENCH

Bizarre Case of Driver Balancing

by John Bisset

SPRINGFIELD, Va. Our treatise on Continental FM transmitter gating card maintenance opened the floodgates on maintenance tips for this series transmitter. (I keep urging Ken Branton, Continental Field Service, to print his "bible" of repair tips, which he has collected over the years on all of the Collins/Continental transmitters. I know it would be a best seller! Hey Ken, it probably would give your field service techs a better night's sleep too, because we'd refer to this book before calling you at 3 a.m.)

★ ★ ★

We recently had a bizarre case we'll call "balancing the drivers." Our 816R needed driver tube replacement. A pair of new Amperex 4CX250Bs were installed, and as the factory recommends, the static driver current was adjusted with the exciter drive removed. The drivers were adjusted to 125mA each, but when the exciter drive was reapplied, the left driver had dropped to half its value. When the drive was removed again, the left driver read about 70mA, and the right driver was fine at 125mA. The tubes were swapped, and the

problem moved with the tube. The old drivers were installed, and a replacement was ordered.

Round two found the problem repeating — but this time both drivers appeared bad. We tried mixing and matching the tubes — being careful to mark them for identification. Regardless of the combination, one or sometimes both tubes would show low current. The problems made no sense — first a "good" tube would go "bad," then test "good" again, so we yanked both tubes, grabbed a trouble lamp and began a thorough search of the driver cage.

While pulling on wires and connections, a connection from the filament transformer to the driver chassis was found to be very loose. Although the screw was intact, it had backed away from the chassis far enough that the terminal was hardly making contact. I don't know if it was good engineering practice or the anger at being up for the third night in a row, but I'll tell you, that terminal will never come loose again. Talk about a torque wrench! We finished the survey of the driver compartment and found nothing else wrong. A set of new tubes was installed and everything fell into place.

Thanks to my associate, Scott Taylor, who discovered the bad connection.

Having seen the havoc a loose screw could wreak, we spent the next half hour checking and tightening all the screws in the transmitter.

Tightening screws reminds me of a humorous experience from a few years ago when I was at Delta. An engineer who was a great AM guy had taken over as chief of a UHF station that had just gone on the air. He wasn't really comfortable with UHF, but it was a job. During his first week on the job, the exciter conked out. He called and asked if he could come by and have one of our techs take a look at the box, as we had plenty of test equipment.

One of Delta's founders, Charlie Wright, was in the lab at the time and noticed the problem immediately. It seems the engineer had a pseudo-technical-type replace the lid on the exciter.

That alone should have been a harmless act. However, in the process of screwing down the lid, the tech also screwed down all of the tuned circuit slugs that protruded from the top of the exciter — because the engineer had asked him to "tighten all the screws."

★ ★ ★

What do an Electro-Voice 313 Shock Mount and biking have in common? We'll have the answer later in this column!

★ ★ ★

Harry Larkin of RF Specialties in Pennsylvania was talking with me recently about RF wattmeter placement. Typically, these meters are placed after the harmonic filter. However, have you ever heard of placing an extra meter before the filter to be used as a neutralization gauge? The thinking is that if neutralization deteriorates, out of band signals will be generated, and they will be reflected toward the transmitter, showing up as higher reflected power on the wattmeter.

Though this metering system should not be used for completing the transmitter neutralization process (refer to your transmitter manual instead), it does offer a means of monitoring performance. The basic idea seems sound. However, we thought we would check with the folks at Broadcast Electronics, who used to have a sensor located between the transmitter output and the harmonic filter. It has since been moved to just past the harmonic filter.

BE's only concern in doing this is the potential for changing the electrical line length between the transmitter output and the harmonic filter. Changing this length of line by adding the wattmeter section could cause oscillations, showing up as spurs on a spectrum analyzer, as well as contribute to operating instability. Of course, the line connecting the cavity to the filter could be cut, so that the inserted wattmeter section did not change the true electrical length, but that could be a lot of work.

Thanks to Stuart in BE's field service for his input. If anyone has successfully installed a meter as described, let us know the particulars.

The guys at RF Specialties have a wealth of transmission planning knowledge — as seen when using their Engineering Applications diskette. If you don't have a copy of this compendium of formulae and

transmission data, contact your local RF Specialties office.

★ ★ ★

Here's a great question for an SBE Exam. How do you troubleshoot a transmitter that has PA plate voltage, no plate current and no output power. The driver stage is operating properly, but there is little or no PA grid current. By the way, there are no overloads and the PA blower is working properly.

If the transmitter is an RCA BTF-20E "Firebox Series," suspect the PA filament leads that run from the ceramic feed-thru caps inside the PA cavity to the filament rings of the tube. We recently helped with the rebuilding of two of these rigs and each displayed corroded lugs on the ends of these cables. The corrosion developed enough resistance to eventually block filament current to the PA tube.

A real quick way to diagnose this problem is to crack the PA compartment door with just the filaments on. Ceramic tetrodes produce an orange glow when the filaments are heating. This test is best conducted in the dark because you can't open the door much more than a quarter to half an inch before the airflow switch activates. Hold on to that door, too. Those RCA blower motors move some air.

If you find the tube not glowing, you can try measuring the filament voltage at the transformer, at the back of the cavity and at the filament rings, though this procedure is really not necessary. If you haven't cleaned the filament wiring connections in several years, you're almost guaranteed to find the problem is corrosion.

In fact, the same corrosion problem can occur behind the cavity, where the leads run from the feed-thru caps to the filament transformer. In either case, an evaluation of the leads must be made. If the corrosion is between the lug and the screw-type terminal, burnishing with Scotchbrite will correct the problem. If you peel back the insulation, and see the ugly green crud "growing" between the heavy cable and the crimped lug, new cables are in order.

Rather than pay the exorbitant prices for a replacement, visit a welding supply shop to get replacement cables. Bring the old cables with you so you'll get the right measurement and proper size lug. For a station T-shirt, the proprietor should also crimp the big lugs onto the cables for you — they usually have the equipment to do this. Thanks to Morgan Burrow of Mullaney Engineering for contributing to this tip.

★ ★ ★

What are the similarities between the EV 313 Shock Mount and biking? Next time you visit a bike shop, see if they can give you an old 1.75-inch inner tube. The combination of the rubber inner tube strength and this particular diameter will give you a plentiful supply of bands to support mikes cushioned in this shock mount. Thanks to Chris Wilk of WFLS Fredericksburg, Va., for this suggestion.

□□□

John Bisset is a principal with Multiphase, a contract engineering service company based in Washington, D.C. He can be reached at 703-323-7180. Fax submissions for the Workbench column to 703-764-0751, or send them via America On Line at wrwbench@aol.com. Printed submissions qualify for SBE Certification credit.

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INTERNATIONAL UPDATE

Eastern European Radio At Work

by Eva Munk

PRAGUE, Czech Republic The radio free-for-all in Eastern Europe is over, and market forces are coming in to clean up the mess.

With the loosening of East European broadcasting regulations and the advent of liberal licensing laws, 1991 saw a virtual explosion of domestic and foreign radio broadcasters across Eastern Europe.

Two-tiered sphere

Broadcasting laws allowed for a two-tiered public and private sphere and were either equivalent to or surpassed Western legislation in their leniency. Licensing was relatively straightforward.

The overlapping spheres of the public and private broadcasters are the biggest problem private radio stations in the Czech Republic and Poland face today, said Michel Fleischmann, Prague general manager for the Pan-European radio network Europe 2.

A subsidiary of the French-owned media magnate Matra-Hachette Group, Europe 2 broadcasts into all of Western Europe as well as the Czech Republic, Poland, the Slovak Republic and Russia, and is currently planning to expand into Romania and Bulgaria.

According to Fleischmann, the existing media law provides for a dual system, in which the public sector is theoretically financed through a state subsidy from a tax on radio and television owners and the private sector supports itself through advertising.

Tight market

The public sector, however, is also allowed to sell advertising space, thereby making the small advertising pot already shared by dozens of private stations even smaller.

The situation is further complicated by competition from television stations like the immensely successful NOVA, which Fleischmann said offers advertising time at very low prices.

Consequently, small- and medium-sized broadcasters are failing at record rates. In the first half of 1995, three radio stations failed in Prague alone. Radio Labe, Radio Echo and Radio Metropolis were closed down by the RTBC for failure to pay their debts.

But the Prague correspondent for the British Broadcasting Corp. (BBC), Julian Duplain, defends public radio with arguments that in times of government austerity budgeting, the subsidies to telecommunications only cover 90 percent of costs, forcing public broadcasters to make up the difference on the open market.

According to Fleischmann, the competition between the public and private sector is a familiar story across Eastern Europe. It follows logically that in the present atmosphere, it is becoming more difficult for foreign investors to crowd into the radio market — especially in large population centers such as Prague, Warsaw and Budapest.

Saturated

Thanks to the excessively free-handed approach to issuing licenses in 1991, Prague is now saturated and the RTBC is likely to start reducing the number of available spots, he said.

Major population centers outside of Prague such as Brno and Ostrava are a better bet for the foreign investor — even though profits are bound to be lower — as competition is not as fierce.

Survival is slightly easier in Poland, where a large émigré community is willing to pour in advertising money from abroad. Broadcasters in Poland, however, do encounter similar problems from competition with the public sector.

Public radio continues to be regarded very favorably by listeners in Poland. Recent public opinion polls showed that 57 percent of listeners still trust public radio more than they do private stations.

But with 40 million listeners and hefty outside support, private radio is beginning to make a dent in the national market.

Bureaucracy remains the prevailing problem in Polish radio broadcasting.

Slovak broadcasters face a set of problems opposite those in the Czech Republic and Poland. After 1991, the radio situation in the Slovak Republic went through a phase similar to that in the Czech Republic.

However, tightening content regulations, a reactive broadcasting board and nebulous ownership rights have made investment in Slovak broadcasting a much more dicey proposition than in oth-

er East European nations.

"The development and legal framework are insufficiently taken advantage of," Fleischmann said. "Slovakia is not a liberal state compared with the Czech Republic, which can be said to be more liberal than many Western states."

The recent controversy regarding the Radio Free Europe (RFE) license renewal is just one case in point. Prior to its August 22, 1995, review of BBC and RFE applications for license renewal, Slovak Council for Television and Radio Broadcasting Chairman Peter Judas reproached RFE, saying that RFE editors "do not restrain from expressing their opinions and political positions." At the same time, Judas praised the BBC for "unbiased, balanced and tolerant" broadcasts.

continued on page 25 ►



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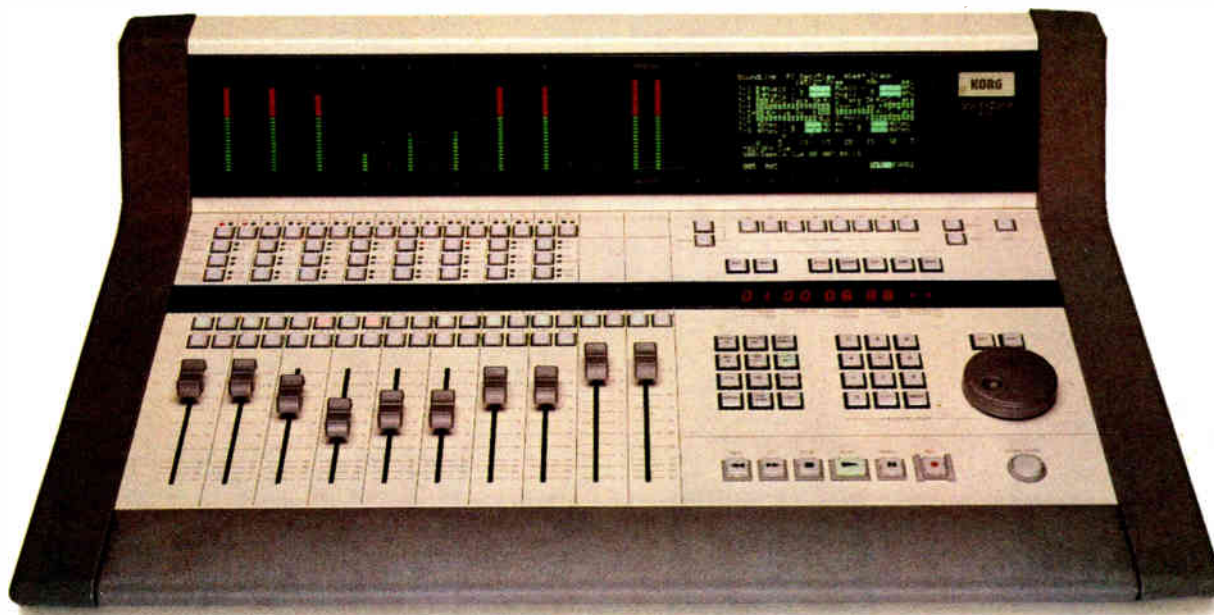


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World Radio History

Studio Sessions

Macs and PCs
finally get along.
See page 22

Equipment and Applications for Radio Production and Recording

The Anatomy of a 'Screamer' Spot

by Don Davis
with Alan Peterson

POTOMAC, Md. Ever wonder where "screamer" spots come from? Those radio commercials for nightclubs that leap out of your stereo and whack you upside the head?

Welcome to the underground bunker at ground zero.

When Jack Daniels Productions near Washington was asked to review the Roland sampler some months ago for *Studio Sessions*, we were also asked to describe the process that goes into cutting one of our high-octane clutter-busters.

As long as we were assured our "secret sauce" for EQ, compression and proprietary Jack Daniels techniques would be divulged,

your helmet for the ride. We follow a remark Jack — the stuff Maryland on the — from takeoff to

While we wait for Screamo to show, Jack Daniels and I are already picking out the music cuts and the effects we will need.

Screamo shows up and is directed to the analog tape studio. Here, he is miked on a Sennheiser 421 through a custom-built console. Compression, EQ

bells approach seismic levels.

Screamo leaves and it is time to assemble the spot. The combination of compression, EQ, reverb and tape over-saturation makes Screamo's voice jump off the tape and bite you on the nose. We take the tape into the digital room for editing.

The digital realm

Music specific to each artist has been selected and is ready to be loaded into an Akai DR4 hard disk recorder/editor. The concept on this spot is to place the listener right in the middle of this concert, not simply play segments of music for the sake of it. Music changes will occur in the clear and duck underneath Screamo's voice track.

Even though the Akai is fast at putting the edits together, we often do our work directly to analog tape and keep it there. Edits made by tape-splicing create an impact that still makes us unique.

Because I come from a solid two-track background, I find it possible to be very creative within the limitations of the format. Even a bit of well-placed tape echo can give a screamer spot color and animation. Whether done digitally or by blade, a mega-hype commercial is nearly impossible to ignore.

Screamo's voice and music cuts are in place. The addition of the punctuators and stingers comes next on an

open track. Explosions and lasers are stock sounds, and there is one compelling effect we add that really creates excitement.

Key words or phrases from Screamo's read are isolated, pitch shifted down or flanged and added back in as a punctuator, sometimes alone or mixed with another effect. The Akai allows us to move and clone the punctuator into different locations.

This process could be done on a sampler, but because we already have Screamo on tape and hard disk, it is a simple matter to feed a piece out and right back in again without trimming and truncating.

Maybe on this spot I will drop in my own voice as a punctuator. A well-placed "oh yeah" or "this Friday" pitch-shifted by a different voice adds variety.

The master mix

Finally we do a mix of the entire spot through the Ramsa console in the digital room. We need to listen to every aspect of the spot: music balance, pronunciation of names and even making sure the concert date is correct.

You would not believe how often a wrong date gets overlooked by the promoter or the arena hosting an act.

This is where the ears take over from the adrenaline. We must catch a problem

continued on page 24 ►



Don "Double D" Davis of Jack Daniels Productions

Answer the phone

Say for a moment Billy Bob Promotions is bringing a concert to the greater Baltimore/Washington area. The four biggest rap artists in the country and a surprise opening act will be playing the Asparagus Memorial Coliseum the end of February.

Bam! We get the phone call and the job.

We have worked with Billy Bob before and understand the sound he needs. Besides the basics (who, where, when), Billy Bob wants some quick-cut music from the artists, a few vocals punctuating the copy and the usual bells, whistles and explosions that work in spots such as this.

Our writing style is straight and to the point on this type of concert spot. Name the artist and the artist's music will carry most of the message. But there is still room for creativity.

We put the spot to paper and clear the copy with Billy Bob. Now, we need to pick from our talent pool.

Because this is a rap concert spot, there is only one man for the job: the Screamin' Demon!

"Screamo," as we call him, is a jock from Washington who knows what it takes to turn in a great performance on this sort of spot. We book some studio time for him and get started.

and dbx settings are tailored to our particular sound. Basic tracks are cut to an Otari 5050 reel machine loaded with 456 tape.

Because we have worked with Screamo before, we know the EQ curve and compression settings that make him sound larger than life. From the beginning of the recording to the four or five takes of our signature tagline, "be there!", his tracks are alive and animated.

Sweet, natural compression

Besides the outboard processing, we record right to analog tape to get that sweet, natural compression that comes with tape. As Jack says, "We are real analog animals. Thank God for 456; I can hit that stuff at +10."

Screamo goes beyond mere "hype." He delivers the message loud and clear. Even when he is rolling at 100 mph, we capture every single word. A little drop of ambience is added in with an Alesis Quadverb and a classic Yamaha Rev-7 that still sounds incredible.

Our studios are located beneath ground level. In addition to whatever sonic correction is on our walls, we are treated to the damping factor allowed by the several tons of earth all around us.

We get the sound we need and the neighbors remain happy when the deci-

Field-
recording
in
Montserrat:
What a
tough life.

Story on
page 24.





Denon's MD Cart™ Recorders and Players are the modern choice for *any* application that requires repeated recording and playback of audio, from broadcast to post-production. Why? Compared to NAB tape carts, the MiniDisc is free from wow, flutter, jamming, stretching, wrinkling, drop-outs and shedding.

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DN-990R MD Cart™ Recorder (shown) and the DN-980R/DN-995R machines

portability, and non-contact, optical media reliability. Obviously, once you've chosen MiniDisc, your next decision is which MD to buy. Features like serial and parallel interfaces, digital and analog signal inputs and outputs, external synchronization, and *MD Remote*™ software (see side bar), make Denon MD Cart the obvious choice.



Denon's MD Remote™ Software, running under Windows™, offers a graphical interface for fast, easy control of all functions and modes on any Denon MD Cart machine, including automatic dubbing of tracks or discs between machines, complete with titles and cue-point information.

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World Radio History

Reel Reasons to Hang onto Tape

by Alan R. Peterson

WASHINGTON Clip and save the Buyers Guide in the next **RW** if radio production is your game: The entire section is devoted to digital editing and production.

Just don't be swift to pitch your reel machine out the back door as of yet.

One jock I knew during the early phase of the revolution said, "Digital will allow us to do anything." So why does this same jock still have a reel machine in the studio?

Because he discovered a few of his favorite tricks did not make the transition to digital — but just might soon.

History lesson

In 1990, the planet entered a new orbit at the Boston NAB show. That was where most of us finally got to test-drive Studer's Dyaxis and AKG's original DSE-7000, now under the Orban name.

Digital audio prior to that was either priced out of reach (the NED Synclavier), for music and not radio (the Fairlight) or lacked broadcast fidelity (early Amiga computers).

But in 1990, we finally touched the shiny panels, entered the cryptic commands that turned our voices into pretty pictures and witnessed the glory of instantaneous rewind.

We even got "tape feel." Real buttons, graphics that resembled tape... and oh, that wheel that let us "rock da reels."

This places radio production's digital revolution at approximately six years old; more if you count the Synclavier purchases at KHS-FM, Los Angeles, and WQHT-FM, New York.

Today, even the smallest stations have entered the digital age with a workstation. In tones of awe and reverence, the new system became known as *The Digital* (as in "run the voice tracks through The Digital").

Which brought with it a snap back to reality.

Early retirement

Did your station put those 5050 and A77 reels out to pasture way too soon when The Digital arrived? Many did and regretted it when it came time to do that sped-up leprechaun or elf voice and noticed the varispeed was missing.

Crazy elfin characters require a simple twist of the speed knob; down to record, up to play back. Fine on tape, but not easily done on a workstation. You cannot put a layer of adhesive tape around the spindle of a hard drive to make it rotate faster.

Funny or monstrous voices going through a pitch shifter may sound glitchy and metallic. Severe pitch changes make a voice robotic and buzzy. Leprechauns become R2D2's cousins.

To be fair, some digital systems do pitch and time changes reasonably well. For example, Roland's compelling demo of the DM-800 workstation cleanly corrects the tempo of Crosby, Stills, Nash

and Young's "Woodstock." (The musicians inadvertently sped up during the recording.)

Sonic Foundry's Sound Forge PC program lets you happily mess with the pitch of anything sent through it. Lots of systems allow mousing and stretching, but give you your product only after rendering the transform.

Can The Digital allow the same real-time, subtle tweaking a varispeed dial can? Soon. I hear they are working on it.

Before the fact

A favorite effect of mine is preverbing, where echo or reverb happens before the desired segment.

In tape days it was accomplished by flopping the recorded tape for a backwards playback, then mixing reverb into the signal on a pass to another machine. When the second tape was flopped, audio went in the "right direction" again, with a reverb tail anticipating the recording, crescendoing into it almost as if predicting the future copy.

In a Windows-style sound editor, you invert the segment, add an echo transform and invert again. On a typical radio station DAW, it means marking a region, inverting it, sending it through the outboard digital reverb to a new track, then inverting it again and pasting it into the desired position on the track. Simple, right?

Not if your DAW cannot invert a soundfile. My Roland DM-80-8 could not do it. That is why I kept the Revox always within reach.

I bitmapped Paul

Last year's Beatles Anthology has compelled a new generation of production folks to play recordings backwards again, hearing the audio trickery that amazed

and perhaps unsettled us years ago.

Or are they? As Bob Miller of KEX(AM) Portland, Ore., pointed out in the Dec. 27 **RW**, "Did you ever try to play a CD backwards?"

More to our purposes, did you ever try to get your DAW to run in reverse? Few if any can, but odds are the one bought for your studio will not. So you still need to thread up that Scully for old Number Nine.

It is for all of these reasons my old buddy still clings to his two-track. Forget mousing, marking and inverting: He reverses sound by threading tape over the pinch roller in a reverse S-path.

Nevermind cloning and offsetting a track for slap echo. He presses his sync button and gets perfect left/right slap.

His speed button gives chipmunks or demons on demand. Two machines placed side-by-side gives him long delay and echo times. Simple low-tech tape looping allows hip-hop beds and effects to run forever with only one splice.

Gimme dat DAT

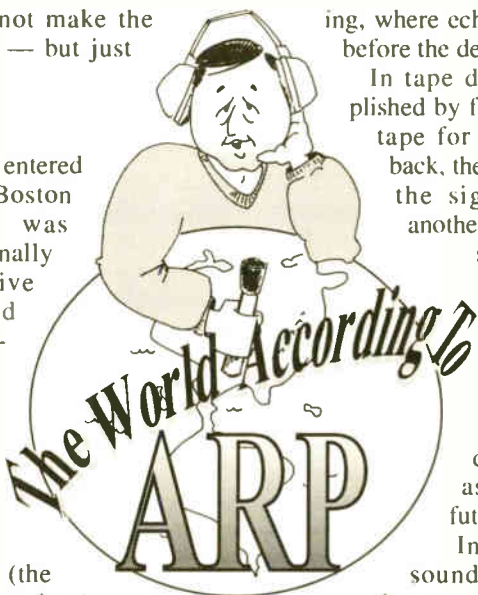
Want more? While many stations send dubs to each other via digital telephone courier service or DAT, not all stations have such a digital link yet. Given their financial position, some may never. Reels continue to come in the front door.

DAT? Think like your bookkeeper for a moment. Would you rather send your competition a six-dollar DAT or 40 cents worth of tape and reel for a :30 dub?

And will your competition keep track of your DATs and send them back? Yeah, right after you mail out those PSA reels bearing the request "Return after airing" piling up at your own station.

Is there still a need for analog tape at your station? Sounds like it to me.

Arguments have been made to discontinue teaching new broadcasters tape editing, that tape is going the way of the buggywhip and the iceman. This from folks who have forgotten the time it took for automobiles to kill the buggywhip industry and for electricity to force the iceman to change careers. Even CDs took their sweet time blowing turntables out the door.



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We have had access to this only six years. This is not for stations to fully obsolete analog recording.

I will not be so biased (cheap pun) as to claim tape is the only true way. I may as well hold out for the all-tube DAW and the return of Big Bands. Digital is inevitable and is clearly the way to go.

But even though 3M and Ampex have rethought their positions on our hero Rusty Ribbon, tape is not yet a curiosity. Analog and digital can and will continue to coexist in the creative production director's arsenal.

Digital can do anything, but a mix of analog and digital is necessary to do *everything*. That is what my jock buddy should have said.



LMA/DUOPOLY CONTOUR MAPS

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PRODUCT GUIDE

Companies with new product announcements for Studio Sessions Product Guide should send them to Radio World, c/o Studio Sessions Editor, 5827 Columbia Pike, 3rd floor, Falls Church, Va. 22041

Phonic Stereo Amplifiers

Phonic Hi-Tech of Irvine, Calif., has unveiled the MAR series of power amplifiers, appropriate for home and pro studio use and mobile DJ operation.

The MAR 2 handles 130 W per channel into an 8 ohm load. The more powerful MAR 4 outputs 240 W, and the MAR 6 delivers 360 W stereo. All three amplifiers in the series can go down to 2 ohms and can bridge at 4 ohms mono.

The MAR series features multiple input connections on XLR, barrier strip and quarter-inch plugs. Outputs are on five-way posts and quarter-inch plugs. Frequency response is 20 Hz - 20 kHz,

with 0.1 percent THD.

For information, call Phonic Hi-Tech at 714-253-4000 or circle Reader Service 34.

Opcode Studio Vision Pro

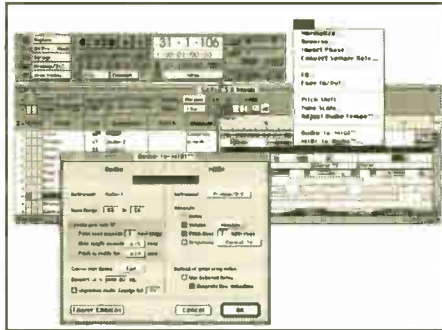
Software manufacturer Opcode of Palo Alto, Calif., is marketing Studio Vision Pro 3.0 integrated MIDI/audio software for the Macintosh platform.

Besides its primary function as a MIDI sequencer, Studio Vision allows recording of digital audio. Manipulation of this data permits glitch-free time compression and natural-sounding pitch shifting.

These features allow matching and correcting tempos between music cuts or dis-

similar voices. It also allows chipmunk-free alteration of a voice talent's pitch.

Up to 32 audio tracks can be recorded and played back, depending on the Mac system in use.



For information, contact Opcode at 800-557-2633, ext. 140, or circle Reader Service 179.

New Ensoniq Mixer

Ensoniq Inc. of Malvern, Pa., is preparing to release the 1682-fx, an eight-bus mixer with digital effects for less than \$2,500.

Designed primarily for users of eight-track modular digital multitrack (MDM) recorders, the 1682-fx handles 16 channels with 32 total inputs for mixdown, has microphone phantom power, dedicated CD and phono inputs and a special output for feeding a sampler.

The 1682-fx also includes Ensoniq's ESP processor chip, offering the user the effects found in the company's DP/4+ and DP/2 processors. A MIDI In jack on the mixer allows effect program and bank changes directly from a sequencer or MIDI controller.

Ensoniq's original target date for release is to be in late January.

For information, call Ensoniq at 800-553-5151 or circle Reader Service 31.

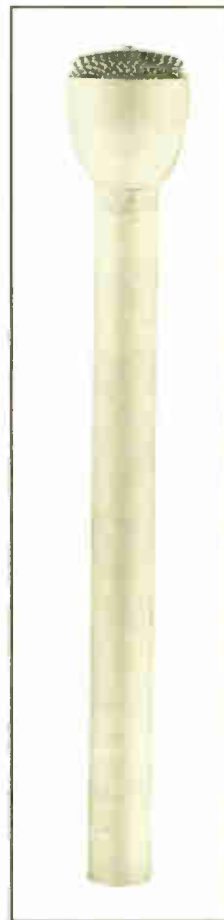
Electro-Voice 635L Mic

Electro-Voice has introduced the 635L dynamic microphone for field reporting and interviewing. It is available through Harris Allied.

Based on the popular "bullet-proof" 635A mic, the 635L is an omnidirectional dynamic microphone with a barrel that is more than three inches longer than its predecessor. This length allows a greater reach with the mic in interviews and in crowded press conferences, as well as a better fit for mic flags.

Impedance and frequency response is identical to the 635A.

For information, contact Harris Allied at 800-622-0022 or circle Reader Service 107.



NetWell Sonic Treatment

NetWell Noise Control of Minneapolis, Minn., manufactures Silence Acoustical Wallcovering. This lightweight acoustic wallcovering is Class A fire rated, durable and has an NRC value of 0.65. It is ideal for radio air studios and production facilities.

Silence Acoustical Wallcovering is available by the linear yard or in full 50-yard bolts. Color charts, catalogs and data sheets are available from the company.

For information, contact Netwell Noise Control at 800-638-9355 or circle Reader Service 134.

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World Radio History

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DIGITAL DOMAIN

Converting Sound across Platforms

by Mel Lambert

LOS ANGELES It is sometimes unfortunate that technical innovations produce not only enhanced creativity but also confusion.

In the case of digital file formats, rapid developments in functionality left out the possibility that we might like to transfer sound files between platforms with the same ease we enjoy with analog material.

The results were inevitable. The worlds of Macintosh and PC-based digital audio editing diverged. Moving sound files from one environment to the other without conversion to an AES/EBU or similar interconnect format involves a great deal of gymnastics.

Translator

One program that I have been using for the last several weeks might prove the answer for routine translations between popular Mac and PC file formats. In addition, it can also handle sample rate conversion, 16- to 8-bit and other related conversions.

The aptly named WaveConvert is here from Waves, an Israeli firm with offices in the United States and Europe. It is available in both Mac and Windows versions, and handles a wide variety of functions with ease.

In essence, WaveConvert offers batch processing and conversion of Mac and PC audio files between different sample

rates, word lengths or bit depths, stereo or mono channels and file types.

These types include .AIFF (Audio Information File Format), .SND, .SDII (Digidesign's Sound Designer format) and .WAV formats.

In addition to plain-vanilla mathematical conversion, the program also provides automatic gain enhancements and techniques for eliminating most noise artifacts while reducing word length of selected files.

Files can be handled individually or in flexible batch-mode processing of numerous sound cues with similar attributes and conversation parameters, a far more useful process. This feature is quite beneficial when a jingle package is moved from a PC-based editor to ProTools or to down-convert a batch of files recorded to DAT from 48 to 44.1 kHz.

Sample rate conversion range is 5 kHz to 48 kHz, with 8- or 16-bit depth conversion, stereo/mono channel conversion and audio level normalization. With the appropriate hardware, sound segments can also be previewed in real time prior to conversion.

Waves' proprietary DSP functions, including bit and sample rate conversion, are said to provide more intelligible speech, increased perceived signal-to-noise, lower truncation noise and reduced aliasing.

Certainly, during extended sessions with the Mac-compatible version of WaveConvert, I found the program very useful, and capable of achieving remarkable

results. Suggested U.S. retail price of WaveConvert is \$299 for both the Mac and Windows platforms.

Making the move

Of course, file conversion is only one parameter to be considered when a decision is made to move a project from one platform to another. For full compatibility, we still need a way for transferring edit data and other information.

Open Media Framework (OMF) was unveiled several years ago and is slowly gaining wide acceptance among workstation manufacturers. It was designed to allow various media, including sound files, to be imported and exported between audio and video systems.

The goal of OMF is to allow both the content and descriptions of edited program material to be shared, exchanged and augmented as necessary. Now in addition to raw sound data, a user can exchange OMF-compatible project data among several platforms.

For example, transfers can happen between an AMS Neve AudioFile or Avid AudioVision editor and perhaps a Studer Editech Dyaxis workstation using a large-capacity magneto-optical (MO) drive.

Anyone attending last year's NAB Convention would have seen such real-world functionality for themselves, via removable media, as well as a local area network (LAN).

At the heart of the process are a series of application programming interfaces (API) that translate file structures from a proprietary format to one that can be read by other OMF-compatible systems.

In OMF parlance, digital audio files become "ingredients" for a designated project, while the program descriptions

— how sound files, edit profiles and DSP data are to be arranged to implement mixing, editing and related processing — are referred to as "recipes."

OMF Media is designed to be interchanged through specified OMF-compliant formats, in addition to optional software modules exchanging media with other digital audio storage formats. OMF recipes support edit decision list (EDL) style information. This allows data relating to edits, crossfades, track source/destination assignments and signal-processing data to be standardized via appropriate file structures.

The full implementation of OMF also allows direct connection over suitable LANs. This can be used to pass multi-track data between dissimilar systems without the need to convert to a transportable media format such as MO, Zip or Jaz drives, for example.

Whether all current workstation manufacturers rush to embrace OMF remains to be seen. But a growing number of editing and recording systems now offer — or plan to in the near future — some or all of the OMF proposals.

In the meantime, file conversion utilities may be a first step in moving materials around a multiformat production environment.

More information on WaveConvert is available from: Waves, 4302 Papermill Road, Knoxville, Tenn. 37909. Telephone 423-588-9307 or fax: 423-588-9472.

E-mail can be sent to waves@waves.com or <http://www.waves.com/waves> on the Internet.

□□□

Mel Lambert has been involved with the production and broadcast industries on both sides of the Atlantic for almost 20 years. He is now principal of Media&Marketing, a West Coast-based consulting service for the professional audio industry. He can be reached via mediapr@earthlink.net or 818-753-9510.

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SHORT TAKE

Audio Demystified: A Small but Smart Book

by Alan R. Peterson

HENDERSON, Nev. Five dollars will not buy a lot for the studio these days. We spend less on swabs, alcohol and blades than before. But a fast five will buy a helpful pocket-sized booklet on audio.

"Audio Demystified: Making it Simple" is a little 35-page booklet available directly from author Franklin J. Miller, audio consultant and president of Sescom Inc.

Most of the booklet is already casual knowledge for the average chief engineer but will be of interest to the beginner or intermediate production person.

The four chapters cover Audio Terms and Meanings, Connector History, System Architecture and Hum & Noise. A preface on electrical safety is included.

The first chapter runs six pages and recaps a handful of definitions most of us already know.

A very short second chapter gives an account of the development of XLR and RCA connectors and the quarter-inch phone plug. You can impress your friends with your intimate knowledge of the evolution of the PJ-042 military connector.

After page 17, the book earns its status as a value. The chapter on system architecture gets into resistive pads, phantom powering and a description of an op-amp gain circuit.

I found myself wanting to see a section or table of simple formulas here in this chapter. Explaining how to calculate values of resistive pads, impedance et al would have been valuable information.

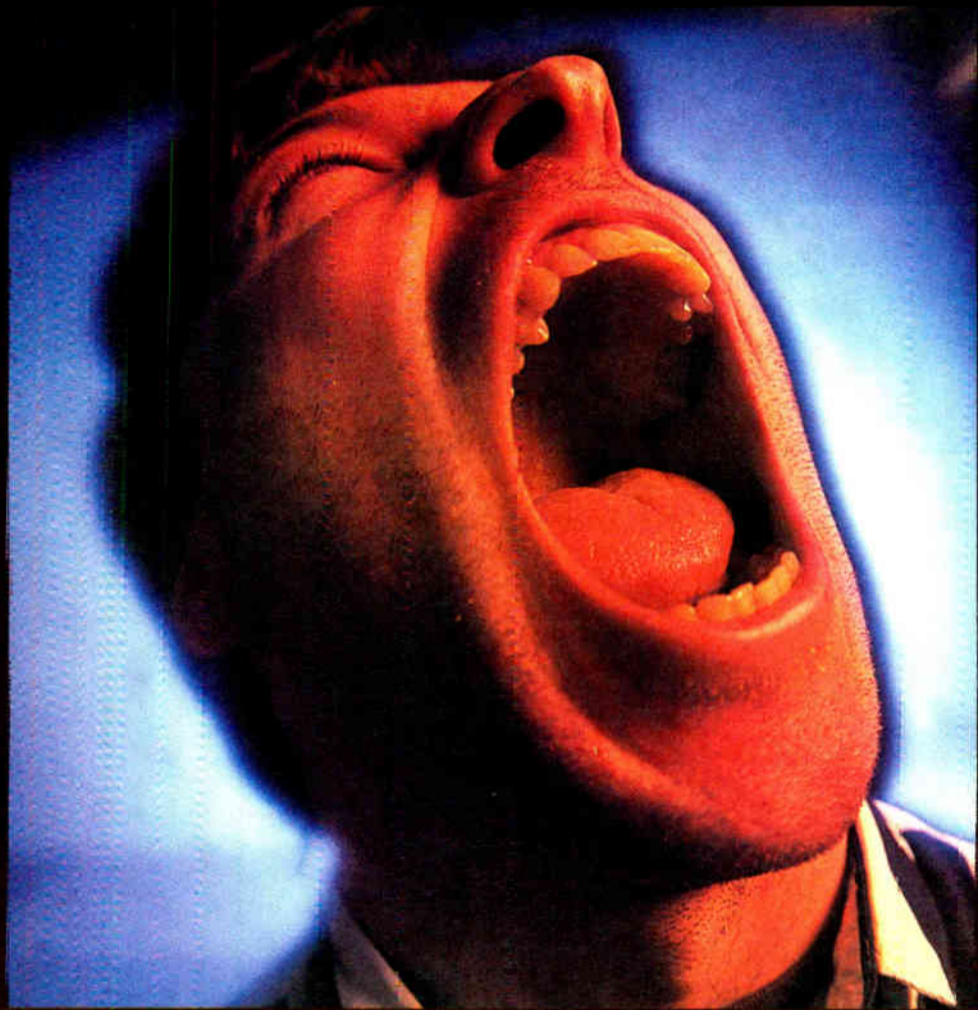
The hum and noise chapter, while simple and basic, contains material that freshmen audio producers should find useful.

This is one thin book. Do not expect elaborate graphics or an ornate front cover. Miller cut and stapled the whole project on a 486 with QuarkExpress and WordPerfect and mails it directly from his home.

But remember, it is only five dollars and Miller foots the postage. Production engineers routinely spend more than five bucks a day at the burger place, so Miller's book is definitely a better value.

"Audio Demystified" can be ordered directly from Franklin J. Miller, 2100 Ward Drive, Henderson, Nev. 89015.

Two Proven Methods To Attract More Listeners.



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



[OPTIMOD 9100: About \$5,000]

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

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

orban[®]

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Circle (116) On Reader Service Card

World Radio History

FIELD IMPRESSION

Field-Recording Sounds of Nature

by Morten Støve
with Gary Baldassari

Editor's Note: Experiences in field recording make for great tales told by audio people. Radio World International Editor in Chief Alan Carter convinced Morten Støve of Danish Pro Audio in Denmark and Gary Baldassari of Incorporated Magi in the United States to share their story. These two engineers went to extraordinary lengths to capture the perfect sound effect.

MONTERRAT Late last year, Morten Støve of Danish Pro Audio, based in Allerød, Denmark, and his friend Gary Baldassari of Incorporated Magi, based in Orlando, Florida, went on several recording adventures. Their travels took them from the launch pad at Cape Canaveral in Florida to the tropical island of Montserrat.

No, they were not stowaways on a space shuttle who were jettisoned over the Caribbean once discovered by the astronauts. But their story is quite a tale.

Radio Spot Is a Scream

► continued from page 17

before the client does. What happens if he hears something we did not notice?

Along the way, Jack and I notice a bit of awkwardness with the way two phrases are butted together. We decide it would sound better if the phrases are swapped in the mix and a different punctuator goes in. Ten minutes immersed in digital editing and we play it back. Much better.

A check of the clock: From the time we began writing the spot to completion — including Screamo's session — about three hours have gone by.

Jack and I are satisfied with the mix. We give Billy Bob a call and play back one solid minute of wall-to-wall scream.

We are told, "That was exactly what I was hearing inside my head when I called you. Great work, guys."

Another fine finish

Billy Bob is happy with the spot and orders dubs for stations in Washington and Baltimore. Even better, the tour continues in Richmond, Va., after it leaves Baltimore, so Billy Bob will want a new tag to this spot to play on Richmond stations.

It may also be possible the "surprise opening act" will change to a name act when the show arrives at its next stop. That means another call to Screamo for some wild lines, a little more editing, a copy of the new act's music for the spot...

But all of that will have to wait until the next spot in line is finished. Just another day in the life at the scream factory, Jack Daniels Productions.

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Don "Double D" Davis is associate producer for Jack Daniels Productions in Potomac, Md., producers of radio spots for comedy clubs, concerts and gospel performances.

It started when a supervisor at the Kennedy Space Center invited them to record a space shuttle launch for reference recording that also was used by broadcasters covering the story. They secured high-voltage Brüel & Kjær microphones as close as 575 feet from the blast off site.

After that the duo headed off to the jungles of the Caribbean island of Montserrat to record live sounds. These will be used as background sounds for a new chain of restaurants in the States called the Bahama Breeze.

The restaurant will use the genuine sounds of the island for background ambiance. The sounds will be faded in and out, when the CD changer is changing from one CD to another.

As enviable as their journey sounds, there was a real purpose to their trip and not just an excuse to escape to the tropics for a week.

Mic technique

They each had two of the new B&K 4052 compact omni-directional microphones with cones mounted above each ear. "Effectively we made our own dummy head and torso but with the human body," Baldassari said. The B&K omnis are not all that sensitive to handling, so the positioning was not extremely critical.

"Our objective was to capture ambiances exactly as you would hear them if you were walking there yourself," Støve said. "This is not as simple as one would think, because the B&Ks are so sensitive to sound that they pick up all sorts of unwanted noises."

"We had to drive out to really secluded areas in Montserrat to get the best effects," Støve continued. "We recorded wind, light rain, thunder, crickets, wind through bamboo and water effects."

One of their more difficult projects was to record the natural ambiance of the small market in the city.

Støve describes it. "I walked around with a pith helmet with the two B&K 4052s and two nose-cone UA0777s mounted on the side of the helmet. I had



Morten Støve recording market ambience. Note hidden mics in pith helmet.

to walk around very slowly and try not to make any kind of noise."

Even though the microphones were hidden in the helmet, the locals could feel that something was going on. After about 20 minutes of recording, some of the locals noticed what they were up to and that reduced the amount of talking for a while.

On the volcano

As for Baldassari, his version of another recording adventure sounds a little more harrying.

"Montserrat is a volcanic island and while we were there, the volcano started erupting. Afterward we went down near the crater. I stuffed my face in one of the vents and came out covered in sulfur," Baldassari said. "The bottom of my sneakers were melting, but I managed to get 60 or 70 seconds of lava bubbling."

Three weeks after the crew left the island, a great part of the population had to follow the same example. The volcano got serious about erupting and eventually exploded.

"Altogether we captured 40 hours of ambiance on tape," Baldassari said.

John Sanborn, their editor, who has access to 35 sound libraries, told the pair that nothing in any of his libraries comes close to their recordings. He will edit

their collection to about 10 hours of uninterrupted effects.

"You can really hear the qualities of the B&K microphones," Baldassari said. "They were used outdoors in the rain without special protection."

Now the restaurant chain wants to sell the album of sound effects. "I like that," Baldassari said, "the possibility of more than 6,000 CD sales."

"And," says Baldassari, "crickets don't ask for royalties."

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Morten Støve is director of Danish Pro Audio ApS, world headquarters for Brüel & Kjær Series 4000 professional microphones, contact him in Denmark at telephone: +45-48-14-2828; or fax: +45-48-14-2700. Gary Baldassari is director of engineering at Incorporated Magi in Florida, contact him at telephone/fax: 407-859-0460.

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Versatile Studio at Hall of Fame

by Keith Clark

CHICAGO In the Jan. 10 *RW*, the new studio at the Radio Hall of Fame was profiled, along with details on its conception and construction.

Here, *Studio Sessions* lifts the panels and examines the completed Hall of Fame facility, and the equipment used for production and live broadcast.

The studio was designed for maximum flexibility, with plenty of top-end equipment assembled to do just that. John Grayson of Graysonics, Evanston, Ill., headed these efforts. Hands-on engineering was directed by Bill Maylone, chief engineer of WNUA-FM in Chicago.

Funds were allocated for the construction and carpeting of the studio. Donations made by major broadcast equipment manufacturers provided the studio components and furniture.

The grand tour

The heart of the studio is a new Broadcast Electronics Mixtrack console, providing a real "radio feel" to broadcasts. It replaces a vintage 1960s rotary fader console. Another significant upgrade was the addition of Gentner's new TS612 multiline telephone system.

Two more outboard mixers are used primarily for enhanced live production capability. A Shure SEM810 microphone mixer with automatic gating handles up to eight Shure Beta 87 microphones and a Shure LX24 diversity wireless microphone system. This configuration is especially ideal for political forums and multi-mic drama productions.

A Mackie 1604 mixer (with XLR10 option) allows the addition of up to 16 more microphones and submixing for further facilitation of large live theater and/or musical ensembles. The mixer is mounted into the Arrakis furniture with a custom input panel providing

convenient connections mounted right next to it.

A wealth of source devices meets any format need: two Marantz PMD510 cassette decks from Superscope Technologies, three Denon CD players, Sony MiniDisc and DAT

recorders, ITC Series II Cart machines and even a new Technics turntable with a Shure phono cartridge.

The Marantz PMD510 decks offer dual cassette wells. Each well is equipped with its own discrete set of stereo ins and outs, two motors, two heads and pitch control. "The PMD510's are great. It's like getting four cassette players in the space of two," Grayson said.

The studio has the capacity to seat a live audience of up to 65 people. A feed to the audience and adjacent stage, as well as to the studio monitors, is distributed via two Hafler power amplifiers driving several Klipsch Professional KP201 monitor loudspeakers. These loudspeakers, suspended via



The Studio at the Radio Hall of Fame in Chicago

Omnimount hardware from the ceiling, provide sound reinforcement to the audience seating area. KP201s are also mounted at the console.

Nearly all programs originating at the studio are fed via ISDN codec to a facility in New York, which provides broadcast via satellite. An Aphex Model 106 Easyrider works in tandem with an Aphex Model 720 Dominator II to provide a consistent ISDN feed.

"If you don't feed the ISDN codec an analog signal with a consistent level, it tends to drop bits in the datastream," Maylone said. "The combo of the Aphex Easyrider and Dominator, with its three-band fast and absolute limiting, are ideal in preventing any detrimental variations."

Another channel of the Easyrider is linked to the automatic mic mixer that in turn feeds the telephone system, bolstering the signal to both callers on the air and on hold.

Another Aphex product, the Aural Exciter Type III, is also linked to the telephone system, preprocessing the incoming audio and making compensations before the signal is sent through the console.

East European Radio at Work

► continued from page 15

The board finally extended the RFE license, pending a review, and admonished the station to "revise their broadcasting," bringing about a protest from the American ambassador in Bratislava.

Proposals made by Vladimir Meciar, head of the conservative Movement for a Democratic Slovakia (HZDS) party, for a government commission to "mould and study public opinion" have done nothing to decrease broadcaster's anxieties.

At present only 17 radio stations are on the air in the Slovak Republic and of those, only three — RFE, BBC and Adventist World Radio (AWR) Europe — are foreign.

"It is still not considered to be commercially worthwhile to start up in Slovakia," Duplain said. "There seems to be less of a

market. Bratislava has only five stations."

Licensing is theoretically as straightforward as in the Czech Republic. But since HZDS moved into a controlling position on the RTBC last September, obtaining licenses has been made difficult for broadcasters who do not meet its "standards of objectivity."

"We do not deal with the government at all," Fleischmann said. "Our strategy in Slovakia is mainly to be on the spot and to wait for conditions to change."

Ownership restrictions in the Slovak Republic also make investment unattractive: Foreign investors are not allowed to hold a majority stake in any company and recent government threats to pass a new public media law that would tighten and increase foreign broadcast regulations has done nothing to increase foreign interest

in this area.

Of the Central European Free Trade Agreement (CEFTA) nations, the radio situation in Hungary is among the bleakest. Political infighting between conservatives and progressives in parliament has put privatization of all media on hold and a revised media law is nowhere in sight.

At present only three radio stations — all government owned — operate in Budapest. And to make matters worse, most FM broadcasters are on the 66 to 72 MHz frequency band and licenses for the Western FM band are virtually impossible to receive.

Technology seems to be the one relatively problem free area in Eastern Europe.

"Today you will find everything and there is no problem bringing things you need from neighboring countries. From the point of view of technology, the situation in the Czech Republic is exactly the same as in France or Germany," Fleischmann said, adding that even in conservative Romania, access to technology and worker expertise was no problem.

As in other areas of telecommunications, price, not availability, is the problem. According to Jiri Roudny, the director of telecommunications at the Czech Finance Ministry, in Eastern Europe communications equipment can cost up to three times more than in the West.

Access to transmitters continues to be a regionwide problem. According to Fleischmann, the problem lies not so much with access and permits to erect transmission stations as in available space.

At present, most broadcasters pay for Eutelsat satellite access through the government-owned Ceske Radiokomunikace. Although the price is high and quality is low, Fleischmann said, it is the best deal available on the Czech market.

There are indications, however, that this situation is improving. At the end of 1994, Russia launched an amateur radio satellite, Rosto, and Hungary did the same with CERS1 (Central Europe Regional Satellite) in February of this year.

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Eva Munk is a free-lance writer based in Prague, Czech Republic.

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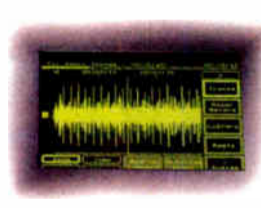
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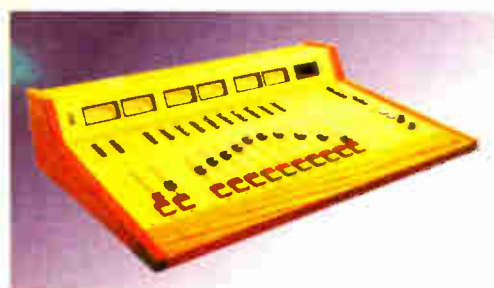
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Adding an SCA Channel to Your FM

Part I of II

by Jim Somich

BROADVIEW HEIGHTS, Ohio The FCC has permitted Subsidiary Communications Authorization (SCA) since the 1950s.

In the early days of FM, the revenue from leasing a subcarrier or two represented a major part of a station's income. The leasing of SCA channels is still a profit

modulation. There are a number of SCA generators available on the market, and there are no restrictions by the commission on their use.

Consider the effect of adding a new channel: in this case, a 67 kHz FM subcarrier, to an existing stereophonic FM broadcast system. Assume the 67 kHz subcarrier will be deviated ± 6 kHz present in the complete modulation spectrum. This is from 61 to 73 kHz.

Add to this energy the main channel mono audio portion, or 30 Hz to 15 kHz. Then there is the stereo pilot carrier at 19 kHz

and the stereo suppressed-carrier double-sideband AM information — which, when fully modulated, occupies the region from 23 to 53 kHz centered around the 38 kHz suppressed carrier.

Several points become apparent. First, the addition of the fully-modulated SCA subcarrier indicates the need for a flat-response transmission system out to 73 kHz, rather than the 53 kHz limit for stereo operation.

If any non-linearities exist in the transmission system, troubles develop rapidly. These include improper neutralization or

loading of any of the RF stages in the transmitter itself, high VSWR on the transmission line or narrow bandwidth characteristics in the antenna system.

Analysis

Acceptable bandwidths are attainable with present day FM transmitters, but it is essential that the transmission system be routinely checked to maintain optimum performance.

A spectrum analyzer, where available, provides the best means of detecting overall performance, however most FM

monitors include the capability of measuring response within 1 dB accuracy from 50 Hz to 75 kHz.

As a preliminary check, the overall response of the transmitting system should be measured using a spectrum analyzer or modulation monitor with a signal generator covering the 50 Hz to 75 kHz range.

If non-linear response is detected at the transmitter output, the defect can be isolated by temporarily connecting the monitor feed to the preceding RF stages or the exciter output.

This procedure is also helpful in isolating crosstalk problems, particularly where neutralized-tetrode IPA or PA stages follow
continued on page 29 ▶



center for many FM stations.

Current FCC rules pertaining to SCA engineering standards define very few parameters. No standards for the performance of the subchannel itself are established.

Few standards

Audio frequency response, total harmonic distortion, pre-emphasis characteristics, signal-to-noise ratios or crosstalk from the main channel programming into the subchannel are not specified. Thus, the commission standards provide no indication of actual performance to be anticipated from the subchannel.

The introduction of digital services in the 1980s and the RDS system in the '90s muddied the waters of technical standards while increasing the need for transparent SCA performance.

In actuality, a subcarrier multiplex channel is capable of surprisingly high quality and low-noise operation. It is readily adaptable to accommodate all present analog and digital transmission systems currently in use.

As a rule of thumb, if the anticipated non-aural information is capable of transmission over a wire circuit, it may be handled on a subchannel with relative ease. If real-time transmission is not required, complex digital data such as .WAV files can be effectively transmitted on a subchannel.

Work is being done to implement reasonably high speed real-time digital data transmission on FM subcarriers.

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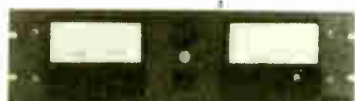
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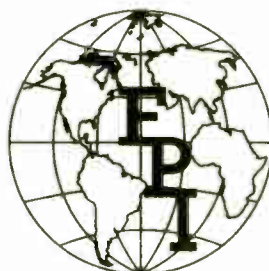
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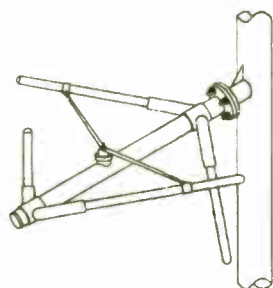
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Add an SCA to Your FM

► continued from page 27

the exciter. Any nonlinearities in the transmission system will seriously affect both main-to-SCA and SCA-to-main channel crosstalk characteristics.

To assure optimum performance, transmission line VSWR must be maintained at as reasonably low a value as possible, typically 1.1:1. Present-day transmitting antenna designs usually provide adequate bandwidths.

If antenna problems appear that result in increased VSWR readings, increased crosstalk between the stereo and SCA information will almost certainly occur.

The addition of the 67 kHz subcarrier to an existing stereo system may result in artifacts in the audible range. These could be beat frequencies of 9 kHz and/or 10 kHz, or random "swishy" audio by-products.

The source of the 10 kHz beat is the third harmonic of the 19 kHz pilot carrier signal that falls at 57 kHz — 10 kHz below the 67 kHz subcarrier.

Some earlier stereo generator designs still in use produced second harmonic content from the 38 kHz suppressed-carrier switching circuitry. That harmonic falls at 76 kHz and beats against the 67 kHz subcarrier, creating a 9 kHz product. These products appear as relatively clean "whistles" when no modulation is present.

When the subchannel is modulated (deviated ± 6 kHz), the products appear as "swishes" as the 67 kHz modulation sidebands are generated. These beat with the pilot carrier third harmonic and/or the 38 kHz second harmonic.

Experiment

Do not attempt to implement SCA operation with an old, marginal stereo generator. If you are stuck with an older stereo generator and are willing to experiment a little, here are some ways to eliminate or reduce spurious signals:

1) Insure that the 19 kHz pilot carrier is free of third harmonic content and does not exceed 10 percent injection level.

2) 38 kHz carrier suppression must be at least 50 dB below a 100-percent modulation reference level.

3) SCA carrier injection should be maintained at a 9.5- to 10-percent level.

4) A sharp 5 kHz low-pass filter (optional with some SCA generators) should be inserted in the SCA program output circuitry. This prevents the appearance of harmonics of non-sinusoidal SCA program material above 5 kHz in the SCA generator output.

These can produce excessive SCA sidebands extending below the lower bandwidth limit and generate interference with the stereo information channel's 53 kHz upper limit.

5) The left and right channel audio inputs of the stereo generator should incorporate 15 kHz low-pass filters. This will insure that sideband signals of the stereo transmission do not extend beyond the 23 to 53 kHz (38 kHz, ± 15 kHz) limits assigned to it.

6) The SCA generator should include a 67 kHz bandpass filter in the output to insure the lower sidebands do not interfere with the 53 kHz upper stereo information frequency limit. The filter also assures that the upper sideband does not extend beyond the 75 kHz upper limit if you are using a 92 kHz subcarrier for telemetry.

7) Although modern FM transmitter and

stereo/SCA generator designs can accommodate a -6 kHz deviation of the subchannel carrier, many broadcast systems utilize equipment of various ages and manufacturing designs.

In a number of instances, consider a reduction in deviation if satisfactory performance cannot be realized within ± 6 kHz deviation of the subcarrier. Reducing the deviation to ± 4 kHz results in a signal-to-noise increase of 4 dB in the subchannel transmission.

If the above precautions are taken, only minimal SCA interference will be transmitted. In most cases, a spectral display will prove that SCA interference is fully suppressed. The station engaged in

SCA and stereo transmission must, however, insure that it is transmitting a clean signal.

Easily verified

This can be verified by a properly operating monitor or spectrum analyzer. Remove all stereo modulation and measure the SCA interference (crosstalk) into the main (L+R) channel and the stereo subchannel (L-R).

Any crosstalk or interference must be down at least 60 dB from 100-percent modulation into the main and stereo subchannels. If these parameters are met, the station knows it is not contributing any intermodulation products or SCA interference.

Stations transmitting SCA have one additional problem: the stereo information getting into the SCA channel.

Crosstalk interference is of great concern

to the background music operator and other users of the SCA channel. Clean SCA with stereo transmission requires optimum performance of the transmitter and associated equipment, and demands better system and equipment linearity than needed for stereo-only transmission.

In stereo transmission, equal levels of signals are transmitted on the left and right channels. When SCA transmission is added, 90 percent of the total information is transmitted on the main and stereo channel with only 10 percent of baseband modulation used for the SCA channel.

Thus, the main and stereo channel is nine times greater in amplitude, requiring high transfer-characteristic linearity.

In our next installment, we will discuss the history of SCA transmission and programming, and touch on composite processing.

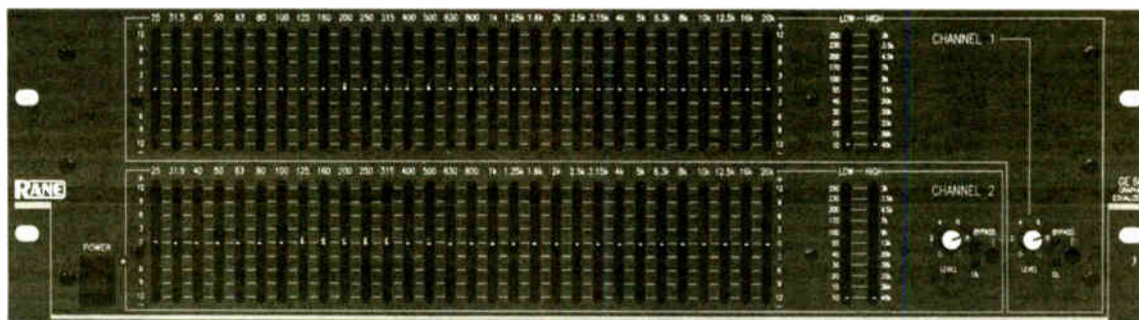
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Circle (212) On Reader Service Card
World Radio History

STATION SKETCHES

Measuring AM Noise in FM Signal

by Tom Vernon

HARRISBURG, Pa. Many FM stations only monitor AM noise when proof-of-performance measurements are taken. That is too bad because AM noise can reveal deficiencies in the FM transmitter system that would otherwise take expensive test equipment to diagnose.

Static noise

By definition, AM noise is amplitude modulation of the FM carrier at an audio rate. It is measured in dB and calculated by the formula: noise = $20 \times \log_{10} E2/E1$; where E1 equals the carrier voltage and E2 is the variation from that voltage.

Static AM noise is what is measured with an unmodulated carrier. Synchronous noise is additional amplitude variation that occurs when the carrier is frequency modulated. The output power dips at the edges of the passband in synchronization with modulation.

Current FCC regulations require the AM noise to be at least -50 dB down, and that the measurement be de-emphasized. The reasons for this are related to early FM receiver circuits. Only the more expensive sets had one or more limiter stages to squash out AM noise.

Early discriminator circuits were very sensitive to this noise, the end result of which is unwanted audio output. Less expensive sets had no limiters and thus were vulnerable. This is the original reason the FCC set up stringent AM noise regulations.

Static AM noise must first be minimized before tackling synchronous noise problems. While the FM monitor will reveal AM noise level, you will need to connect an oscilloscope to the monitor's output to locate the source of the noise. If you can obtain the use of a spectrum analyzer, so much the better.

By determining the frequency of the noise, the source can frequently be located; 60 Hz noise can usually be traced to a filament ground off center, 120 Hz indicates poor filtering of the screen supply or control grid bias. And 180 or 360 Hz ripple indicates trouble in the PA plate supply, if your transmitter is fed from a three-phase system.

Once power supply problems are rectified, so to speak, you can go after other sources of static AM noise. In older transmitters, cleaning and lubricating sliding contacts for tuning and loading can work wonders. Rubber shockmounts for blowers and fans harden with age, and can transmit vibrations into the PA cavity, as can bad motor bearings. For a quick check, temporarily disconnect blowers while observing AM noise. A sudden drop will pinpoint the problem.

Synchronous noise

Once static noise has been minimized, you are ready to tackle synchronous noise problems. If the passband of the transmitter, transmission line and antenna is not flat for 150 kHz (+/- 75 kHz from the assigned carrier frequency), then you have a source of synchronous AM noise that will degrade overall performance. The narrower the passband, the more power is reduced during modulation swings, and the higher the synchronous noise level.

From basic circuit theory, we know that in a resonant LC circuit $XL = XC$. For frequencies above resonance, $XL > XC$, below resonance $XC > XL$. When

modulation is applied to a system with less than 150 kHz passband, the load of the PA tube alternates between capacitive and inductive reactance.

This varying reactance is the same as a varying phase shift in the circuit. Phase modulation is similar enough to frequency modulation to fool the discriminator, which will demodulate it as distortion in the composite signal. This distortion can result in degraded main to subchannel crosstalk figures, or leakage of the L-R into the SCA — highly undesirable.

Tuning for minimum AM noise is critical to good performance, as it centers the transmitter passband on the carrier frequency.

From basic circuit theory we know that the AM noise null and peak power output will occur (theoretically) at the same point. Being off the peak power curve by a few degrees may result in an almost unmeasurable power loss, but an increase in synchronous noise of several dB.

To tune the entire transmitter for minimum AM noise, modulate it at 400 Hz, 100-percent modulation. Now go back and retweak all tuning controls for minimum AM noise. Such retuning may change other operating parameters, so some compromises may have to be made. When you are all done, a -50 to 55 dB synchronous noise level should be possible.

In the real world, the AM noise null and the peak of the power curve may not

coincide. This indicates asymmetry in the system, which should be investigated. In such instances, tune for the null.

Some transmitters may have more complicated AM noise problems, such as a shift in AM noise null and peak power points as a function of varying power output. In these cases, a call to the manufacturer's customer service department may be in order.

As if all of this isn't enough, the transmission line, filter and antenna can also cause problems. This can be a function of narrowband design, lightning damage, corrosion or mistuning.

Substitute a dummy load for the antenna, retune, and then note the noise figure. Discrepancies between the dummy load and antenna figures indicate trouble. Another approach is to look for changes in the VSWR readings over the 150 kHz passband, as this is also an indication of problems.

Careful investigation and reduction of AM noise in the FM transmitter system can yield vast improvements in the quality of the stereo signal. A systematic inspection of the exciter, transmitter and antenna as subsystems should enable you to pinpoint the location of AM noise.

□ □ □

Tom Vernon divides his time between consulting and completion of a doctorate degree. His radio home is the award-winning WXPB in Philadelphia. You can reach him via e-mail at tlvernon@aol.com or by calling 717-367-5595.

SIGNAL-TO-NOISE

Listen Up: Subscriber On-demand Programming

by Frank Beacham

NEW YORK As further evidence that new audio delivery methods are circling the wagons on traditional radio broadcasting, a Cupertino, Calif.-based start-up is about to begin testing a new on-demand audio subscription service.

Utilizing computer storage technology and the high-speed delivery capability of cable television, the new "pay-per-listen" service — called "Listen Up" — is the brainchild of Information Highway Media Corp., a new company headed by Nathan Schulhof, a pioneering executive in the distribution of computer software on CD-ROM.

Take your pick

The idea is for the listener to pick from a catalog of audio programming and have that programming delivered on demand in a matter of seconds. Basic subscription service would cost about \$10 a month plus a fee for each pay-per-listen selection. The Listen Up hardware would sell for about \$500 or could be leased with the basic service for about \$25 a month.

The Listen Up audio hardware consists of a docking unit that hooks to the cable television system and a detachable portable player that can be

used for audio playback at any location. The player, which features instant access to any of the downloaded audio segments, can hook to a home stereo, car sound system or be used as a self-contained portable "Walkman" with headphones.

Currently, the prototype player uses a miniature hard drive with MPEG compression for audio storage. Future plans call for the use of flash memory when prices for that technology come down.

"Right now we need about 170 megabytes of storage to hold 10 hours of FM-quality audio," said Cynthia West, vice president of strategic alliances for Information Highway Media Corp.

About 10 hours of audio can be downloaded to the hard drive in about 10 minutes. Such downloads can be scheduled on a daily basis — say during the early morning hours — or anytime a particular program is desired.

Listen Up subscribers will have the choice of a wide range of audio content including books-on-tape, how-to and self-help programs, radio and TV shows, movie reviews, music of many genres, educational subjects, hobby and special interest topics, product information and more.

continued on page 32 ►

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Subscriber On-demand Programming

► continued from page 31

Using a keypad on the Listen Up unit, the user punches in the codes for the catalog selections and then places the device in the docking station. The request is then transmitted automatically via cable upstream to the Listen Up headquarters. The programs are downloaded minutes later.

Customized download

As part of the basic service, each subscriber will also receive a customized daily download based on predetermined preferences. For example, a Listen Up subscriber might ask for an early morning

package of news, sports, certain stock information and a preview of new releases of mystery novels and self-help programs. The download could be scheduled for completion just before the subscriber's daily commute or morning exercise regimen.

The copyright holders of the audio programs, who have stored their material on Information Highway Media's server, receive a royalty payment for each time a subscriber listens to their program. At the end of 30 days, the software in the Listen Up system causes each audio selection to self-destruct and disappear from the storage unit.

Currently, Information Highway Media Corp. is assembling a huge catalog of programming for a series of user tests set to begin in Palo Alto, Calif., in the first quarter of 1996. Among the programmers participating in the tests are the Associated Press, Harper Audio, KJAZ Satellite Radio, Newsweek, Cowles Business Media and New Dimensions. (See related story p. 6.)

"For the test period we don't want to make assumptions about what kinds of programs people will want to listen to," said West. "We want to provide them with a very rich and deep library and let them select."

However, West said, the company expects the results to be consistent with previous experience.

Audio bestsellers

"We suspect that in the end, 20 percent of most of our content will be the most popular," she said. The best guess for hit material: audio versions of bestselling books and magazines.

West said Listen Up is not wedded exclusively to cable television systems for delivery. Direct-to-home television satellite systems, ISDN telephone lines and even RealAudio technology over the Internet are other possible delivery methods.

If all goes as planned, Listen Up will launch its national service by the end of 1996.

Information Highway Media Corp. is located at 20600 Mariani, Cupertino, CA 95014; 408-255-5301.

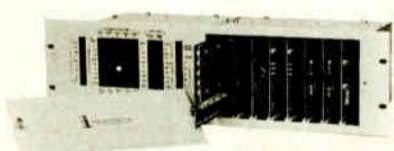
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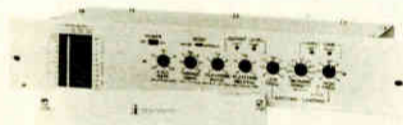
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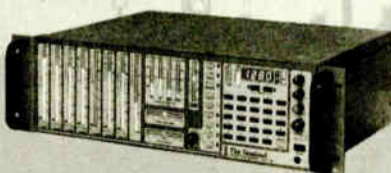
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64 Years Ago

Reprinted from Radio World
January 16, 1932.

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.

13 PUT OFF AIR DURING YEAR FOR OFFENSES

Washington.

During 1931 thirteen stations were ordered off the air for failure to maintain standards consistent with "public interest, convenience or necessity." The Commission acted more strictly with offenders than during previous years.

Besides, five stations were deleted as to identity when they consolidated with other stations, and two more stations combined to form a new station.

To solve a major problem of administration concerning the method and policy of handling applications for renewal of licenses, a plan staggering the license periods of all broadcasting stations was adopted. The 612 stations have been segregated into six groups, according to operating frequency, and each group has been assigned a fixed license term of six months.

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M. & S. Electric Co., New York, N. Y., electric machinery—Atty., R. Honigman, 2 Lafayette St., New York, N. Y.

Charles H. Maggs Electric Co., Long Branch, N. J., electrical equipment and machinery—Atty., Maurice A. Potter, Long Branch, N. J.

Electro Fire Detector Co., Inc., Newark, N. J., electro fire detectors—Atty., Israel B. Breene, Newark, N. J.

Storm King Corporation of America, New York, N. Y., radios, radio parts—Atty., United States Corporation Co., 150 Broadway, New York, N. Y.

Richard Larkins Corp., New York, N. Y., electrical apparatus—Atty., Flatow & Taflove, 17 John St., New York, N. Y.

Jacob C. Schuff, Inc., Ocean City, N. J., radios, automobile accessories—Atty., George R. Greis, Ocean City, N. J.

Multivix and Television Industries, Inc., Wilmington, Del., mercantile manufacturing and trading—Atty., Corporation Service Co., Wilmington, Del.

Kovalite Co., Dover, Del., electrical fixtures, lamps—Atty., Capitol Trust Co. of Delaware.

Brotherhood of Electrical Workers of America, Inc., Pittsburgh, Pa., maintain a social, beneficial and protective order—Atty., Capital Trust Co.

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3.



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Navigator (KDLT)

A 00:04:14 intro: 09
B 00:00:00 intro: 00

All Around The World

11:00:00 -> 11:49:10 00:49:02

A 04'23 All Around The World - Lisa Stansfield 19"
 B 04'10 I Wish - Stevie Wonder T 18"
 C 04'29 Set Them Free - Sting 35"
 C START DAT2
 01'19 [Bottom of the Hour]
 00'03 R-r-r-Radio -
 00'45 Casual Furniture -
 00'30 Harley Davidson -
 00'35 News Call 1 -
 T 00'34 Cancer
 T 00'34 Japan

"Hot Keys"

Carts

ON

1
Applause

2
Window Crash

3
Roar II

4
Plane & Car Crash

Inflight M

10 s 5 s 0 5 s

All Around The World I Wish

fade out... 00:04:08 fade in...
 xfade... 00:03:45 begin off...
 end off... 04:23:28 att. (dB): 1:0

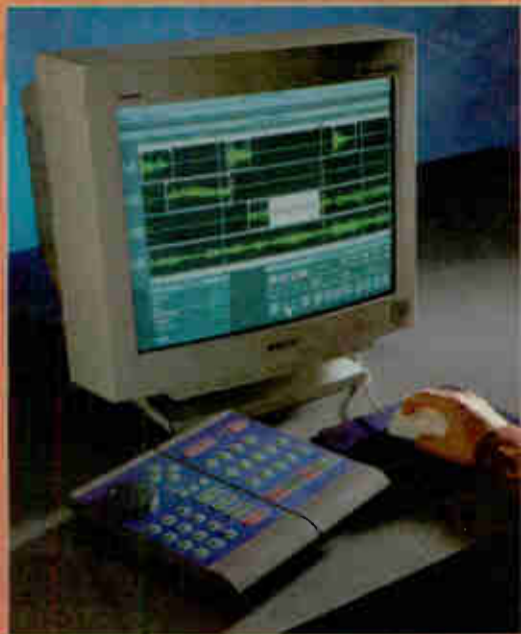
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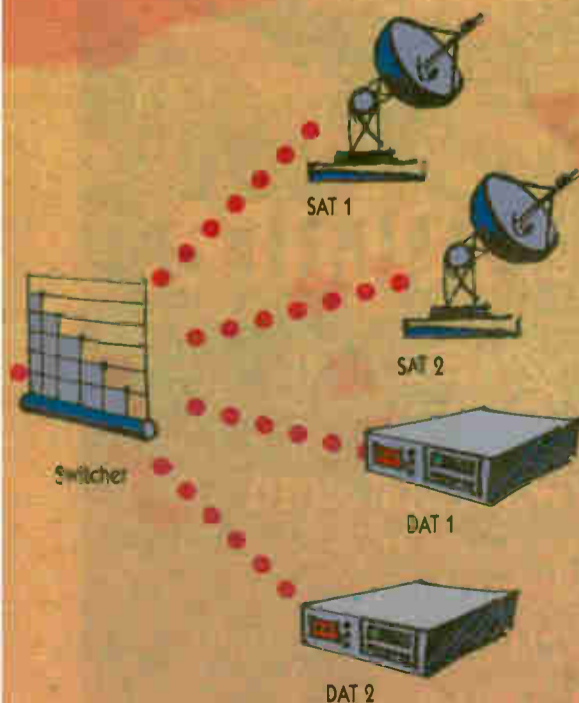
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Since the development of Colossus, the World War II era British code-breaking computer, computers have changed dramatically. Once used almost exclusively for scientific and military endeavors, computers are now commonplace in businesses and many homes the world over.

The development of small, powerful personal computers in the 1970s and '80s forced many businesses to significantly alter the ways they operate: Radio has not been exempt from this change.

From the production suite to the sales office to the on-air studio, computerized systems are available to handle every chore. Software protocols like MIDI can automate production tasks, newsroom systems can automatically capture feeds from information services and remote reporters, and digital editing and playback systems can help stations economize on ancillary equipment, tape and staff.

But integrating computers into a station requires more than a little forethought. Engineers may need to modify the studio layout, management will need to discover creative ways to apply the technology and the staff must prepare for operational changes.

radio.sys is Radio World's occasional look at the rapidly evolving state of computer-based technology for radio broadcasting.

radio.sys

From On Line to On Air

Windows 95: Making Its Way into Radio or Not?

by Alan Haber

WASHINGTON It would be hard to have missed the build up and hype surrounding the release of Windows 95, the latest computer operating system from Microsoft.

While viewed by some as a transitory step on the road to a full 32-bit operating system (Windows 95 incorporates 16-bit code), the major overhaul by Microsoft of its flagship product does enhance efficiency by managing memory better. It also provides compatibility for older Windows and DOS programs.

But is Windows 95 the right operating system for radio stations? What about true 32-bit programs like Windows NT or OS/2 Warp? Or does the operating system even matter?

Talking to nine manufacturers of computer-based products for radio stations turned up a mixed bag of opinion. Some,



like Fort Worth, Texas-based The Management, offer a mix of Windows- and DOS-based products.

Others, like ENCO Systems utilize only DOS. "Windows is one of the best software packages available for typical desktop applications, (but) it has become obvious that it is not the ideal for fault-critical revenue-producing applications such as broadcast on-air control," said Larry Lamoray, ENCO vice president of sales and marketing.



The ENCO DAD486x utilizes DOS, said Lamoray, "in a very high level manner that resembles, but improves on, Windows features, to configure a system where we maintain absolute control of all operational parameters and memory allocations, thereby achieving significantly better speed of operation and ensuring protection from unpredictable crashes."

Despite the misgivings, ENCO is keeping its eye on the future. Lamoray said the company is actively evaluating all the non-Windows based advanced operating systems and will offer a product that takes advantage of the improvements available.

Another company looking at migration to advanced operating systems is Dalet Digital Media Systems, which is based in Paris and has U.S. offices in New York and Far East offices in Singapore. Stephan Guez, director of research and development, said Dalet is looking at Windows NT, because of its status as a "very stable platform." Dalet plans to introduce an NT product in the first quarter of 1996.

But do not count Windows 95 out at Dalet: Guez said that the company probably will have a 95 version at the same time.

Dalet committed to utilizing a Windows 3.1 interface "from the beginning," Guez said. "It will be difficult in the future to get a 3.1 version of Windows," Guez said,

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"We will have to propose something, especially to people who do not want to go to Windows NT right away."

Windows NT and Windows 95 are both being developed at Kansas-based Computer Concepts. Versions of the Visual Traffic scheduling and the Maestro on-air control systems, are planned for both platforms for release next year.

User feedback

MediaTouch System manufactures a digital audio management system called MediaTouch. The product currently runs on a DOS platform, but Marketing Director Doug Anderson said it will probably move to NT or 95 "very, very shortly." The final decision about a platform, he said, will depend upon user feedback.

At Soundscape Digital Technology, the company's software for its SSHDR1 hard disk eight-track recording system runs under Windows, but it runs fine under Windows 95, according to Jerry Reiner, director of U.S. operations for the Welsh company.

Reiner said that Soundscape "will migrate to a real 32-bit application," although its software does not really require that kind of power and does not use much of an operating system.

This, of course, begs the question: How important is the operating system?

"Let's say there is an operating system out there that you are using, and you are used to it, and three years down the road the operating system changes," Reiner said. "If you are still getting exactly what you require, then the old operating system works. If the new operating system will give you advantages, then perhaps you need to look at that new operating system."

Computer Concepts Regional Sales Manager Rich Hadedank concurred, saying that, if stations are happy, there is certainly no compelling reason to move to any other operating system.

Hadedank noted, however, that data-intensive applications, such traffic and commercial routing, would take "advantage of the more robust, higher-performing (32-bit) operating systems."

Operating systems

Although DOS is currently the operating system of choice for Radio Computing Services (RCS), "all new development is being done on 32-bit operating systems," said RCS Vice President for Development and Support Ted Nygreen.

Specifically, Nygreen mentioned Windows NT and IBM's OS/2 Warp. Nygreen was the only person surveyed to mention OS/2.

Why OS/2 Warp? "At the current time, Warp has a better infrastructure for dealing with audio and streaming audio," Nygreen said.

In the future, RCS non-audio products will be targeted to run under Windows 95 or other 32-bit operating systems. The first advanced operating system-oriented product, a basic configuration of Master Control, is scheduled for release in February 1996.

Despite the migration by RCS to 32-bit operating systems, Nygreen said he believes that the operating system, when it comes to audio and automation products, "from the point of view of the radio station, should be of minimal concern. It should not matter whether the product comes running under UNIX, OS/2 or whatever."

It is a different story, Nygreen said, for other applications. "If you are going to run a desktop application, then of course it matters. If somebody is running Windows,

they do not want to have to go out and change operating systems just to be able to do their music scheduling, for example."

The 360 Systems product line is not Windows-based. "All of our products are basically dedicated hardware," said Director of Marketing Steve Cunningham.

Why opt for dedicated hardware instead of a commercial operating system? "You can build products that are far simpler, that are far more efficient and are finely tuned for the specific application," Cunningham said, "and you can put them all in a box that presents the user with a set of controls that looks like something he wants to use, rather than a bunch of 'F' keys and a mouse."

So, where is it all heading? Is the migration to Windows 95 a reality that radio stations need to contend with?

Noting that the migration to Windows 95 has not happened yet in business, The

Management General Manager Adrian Charlton said "The real defining course here is what is the business software that everybody's going to buy in a year?"

Charlton said The Management is "looking heavily at going to either 95 or NT, or a combination of both, depending on where the market is leading."

For his company, the "next plateau" may consist of a Windows 95 front end and a Windows NT server back end, taking advantage of the high performance file system that NT offers.

No rush

Not all manufacturers of computer-based radio systems are rushing to migrate to 32-bit operating systems. Roscommon, Ireland-based Radiomation, for example, is working on a Windows for Workgroups 3.11 platform. "We are quite happy with Windows," said company President Michael Farrell.

"We have a solid platform."

Farrell noted that Radiomation does not "see it as part of our brief to pioneer new software and new platforms. What we have works very, very well as it is, and unless there is a very good reason to change, we are just going to wait until all the problems have been ironed out."

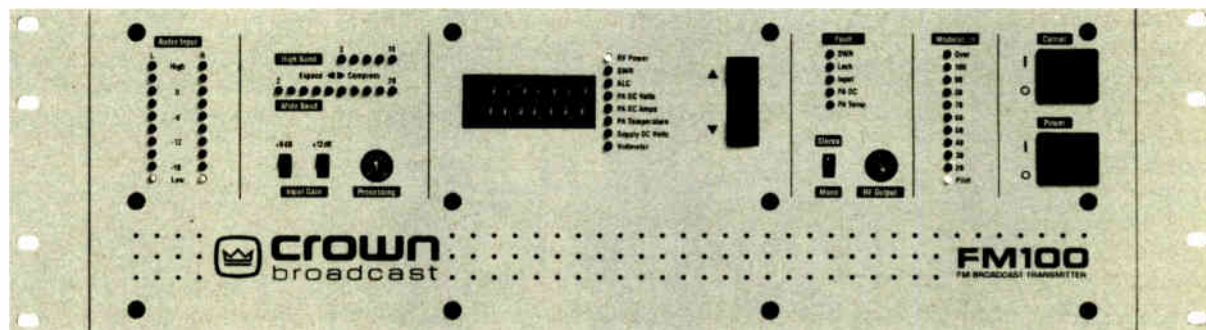
Choosing an advanced operating system may or may not wind up being important to your station, but you might want to keep Charlton's words in the back of your mind when considering a move.

"Here is where the law of natural selection takes over," he said. "For the companies that do not write good software, it will not matter what operating system they are under."

□ □ □

Alan Haber is a regular contributor to Radio World.

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Easing the Analog-to-digital Shift

by Mike Sokol

HAGERSTOWN, Md. Given all the new up-and-coming technologies, integrating the new with existing techniques and machinery can be a bit painful.

This is certainly true of digital audio production, where simply substituting a digital device for an analog component is sure to cause operational headaches.

Over the past five years, I gradually changed my production studio from an all-analog to predominantly digital. Here are some tricks and tips I have learned along the way.

First off, be sure to record and log all

narrative tracks on DAT tape. This is what originally justified and paid for my first DAT recorder. The cost difference between quarter-inch Ampex 456 tape and DAT tape was substantial.

Savings

A little simple arithmetic revealed an annual cost savings in excess of the cost of a new DAT machine. This helped encourage me to jump into the thick of the digital fray.

Second, make certain that you watch the peak record levels. This was my first hard lesson in digital recording.

With digital tape, you cannot count on

analog tape saturation to "soft-limit" nasty peaks. While tube circuits and biased tape can actually sound musical when distorted, digital tape has no "give" when it is peaked. When outfitting my studio I performed a sonic evaluation of a variety of limiters, and selected the dbx 160 as a "pre-brick wall" cushion.

Additionally, when recording mono signals, set the pan control on the DAT recorder so that the right channel recording level is 6 to 10 dB lower than the left one. When transferring the data to the hard drive, select the left channel by default. If the track has been clipped for some reason, go to the other channel.

Next, clean up your act. Hisses, hums and distortions originally masked by the artifacts of old analog decks may now become apparent. It may be necessary to upgrade the mic preamps, use better cable and check all the grounds for hum-inducing loops. This makes all your productions cleaner and better able to tolerate final processing without introducing lots of grunge.

Hold your breath

Do not let the talent breathe. This sounds a little harsh, but not to worry, that is what digital editors are for.

After the tracks are recorded to DAT — and they are transferred to a workstation — put a marker or zone break at the end of each sentence or breath. This lets you quickly assemble the piece while leaving the breaths out.

Of course, you need to insert about 100 milliseconds of dead air where the breaths used to be, or the read will sound inhuman. I usually make a 3 frame (100 millisecond) sample of quiet room tone to insert in those spaces. You can then fudge this value for just the right flow. This capability also allows you to polish a mediocre read into an acceptable product.

Timing is everything in radio, and with a digital editor you are in control. As one of my agency producers likes to say: "A voice, barely alive! We have the technology. We can rebuild him. Make him stronger, faster, more coherent."

Having said this, however, do not worry too much about timing while directing talent.

Most digital editors can speed up the pace of a read without changing the pitch, so you can relax if the talent runs 2 seconds too long on a 60 second spot. Just get the best emotional read possible. Once the clip is in the editor, simply tell it how long you want the soundfile to be. After a few minutes of number crunching, a new clip is born.

Manipulate the music

Usually a read can be sped up by 10 percent without any noticeable artifacts, which works out to shaving off 6.6 seconds from a 66 second spot. There is simply no way to do this with traditional analog production techniques. This technique also works for music, allowing you to change the tempo or key of a piece independently.

Digital production also lets you "tweak" music libraries. You can easily modify a good music track for use in a variety of spot formats. Verses can be repeated, slow parts dumped and singers inserted wherever you want.

One trick to remember when editing music is that while most pieces are

written with eight-beat phrases, there is usually an intro note (technically a pick-up note) after the eighth-beat leading into the next measure. If you break up the track into groups of measures for reassembly, the pieces fit back together better if the breaks are done on the eighth beat instead of the downbeat (beat one). This keeps the pick-up note or swell with the appropriate measure.

Nature of the beast

One downside I have encountered with a digital studio is that you always run out of drive space when it is needed most. This is just the nature of the beast.

Fortunately, hard drives are cheap; add an extra one to your system before you get into trouble. It does not even have to be as fast as your editor requires, you can use it as a holding tank to transfer files from the main drive that are not immediately needed.

I use an extra 1GB IDE drive to hold all my stock music drops and sound effects for different promotions. That way I can call up a sound effects bed I used on a promotion six months ago without having to reload it from a backup tape.

If you can afford it, a CD-ROM recorder can be a great way to catalog files for different projects. Pinnacle offers one that costs less than \$1,500 and plugs easily into a SCSI port. Having more than 600MB of data on a \$10 disc is a pretty cost-effective means of archiving soundfiles you may not need for another year or two.

Finally, consider using the Internet to transfer narrative audio. This is a trick that all 15-year-old computer kids know how to do, but one that seems foreign to adults older than 30.

If you have a digitized version of a narration in your computer, you can transfer it via modem over the phone lines with no loss in quality. You do not need special equalized phone lines, codecs, or microwave links. You just need a little extra time.

How it works

Here is how it works: Assume you are working on a character spot that needs a great Peter "Colombo" Falk impersonator. The best one you know lives in New York, but your studio is in Bonn, Germany. Of course, budget and time constraints do not allow you to fly in the talent, so a local studio is found for the talent.

The director in Germany may listen over the telephone and prompt the talent until a correct read is achieved. Then the tape is shipped overnight via an international courier. The tape is then played back at the production studio and assembled into the spot.

This scenario usually works pretty well except when there are last minute changes or mistakes. Then the talent must be contacted again, a new voice take done and special courier service used. And in the background is a nervous client that wants his radio spots to mesh with a big ad campaign that is already at the printers.

However, if both studios have a modem and a connection to the Internet, the soundfile can be transferred in a few minutes.

Go back to the studio where the talent is receiving cues from the director. Once a good take is recorded, the engineer loads the DAT into a workstation, exports the desired audio as a .WAV soundfile, and

continued on page 41 ►

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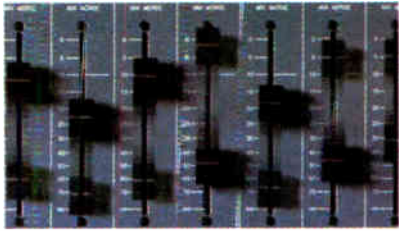
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READER SERVICE NO. 61

System Setup Takes Time, Patience

by W.C. Spenn

SAN ANTONIO, Texas I regularly receive requests from station owners wanting to connect a computer in the production room with one in the on-air studio with one in the sales office. They also want it to include an Internet e-mail system and maybe a World Wide Web (WWW) site.

First things first

To this list they add some kind of backup and redundancy system to ensure 24-hour operation. And, to top it all off, they have an eight-o'clock meeting the next morning, and want the recommendations and price estimate faxed to them that evening.

I will not do it, even though some others will. Yes, the client is asking me to take their money, but I cannot make an honest recommendation without considerably more information.

The first thing I need is a very current and complete inventory of the computer hardware — including available hard disk space — at the station. The client may already have the hardware they need

Ease Shift To Digital

► continued from page 38

"mails" it via Internet to the e-mail address of the production studio.

Very shortly, the file is at the remote site, ready to be inserted into the digital editor. All that is needed is a common interchange format. In most cases, .WAV files are perfect.

Audio files are huge in comparison to text files. A 30-second 44.1 kHz, 16-bit recording is approximately 2.5MB long and takes about 20 minutes to transfer via modem. Traditional computer compression schemes, such as PKZIP, cannot be used as there is not enough redundancy in a .WAV file.

ADPCM compression, however, works very well, and is available through the Turtle Beach WAVE Editor, Creative Labs SoundBlaster Pro and Microsoft Windows. It allows for a 4:1 compression rate, thereby reducing a 30-second narration to approximately 650KB. This can be downloaded in five minutes or less.

Allowing for uploads and downloads — and depending on the speed of your Internet provider — any soundfile can be sent anywhere else in under 20 minutes.

Have the talent get a cup of coffee while you listen to the file. If it is good, then issue the talent a check and be happy. If there is a problem with the read, have it redone on the spot and uploaded again.

The monthly cost for Internet access is much cheaper than an international courier; it practically pays for itself the first time you avoid a Saturday or next-day courier delivery.

Plus the spot gets delivered days earlier, which means your client gets some sleep and you get paid sooner. I love this technology.

□ □ □

Mike Sokol is a musician, audio engineer and computer specialist. Contact him at his audio/video production studio, JMS Productions Inc., in Hagerstown, Md., at telephone: 301-791-2568.

to implement much of the system they want. There is no need to buy a top-of-the-line, fully loaded computer if all it is used for is occasional word processing.

An inventory also helps me to determine what current and requested hardware cannot coexist in the same computer.

I cannot make a knowledgeable recommendation without a scaled layout of the station — with each current and expansion computer location marked, labeled and cross referenced with the hardware inventory list.

The layout helps me determine the local area network (LAN) and communications cabling requirements. Part or all of the LAN may function better using coaxial cable, while another part might perform better using unshielded twisted pair (UTP) cable. Equipment location is critical for optimal installation and efficient operation.

Hardware location and inventory information must be compared to software location and inventory. Many times, when a client buys a computer, they purchase software they already own. This happens because many computers come with preinstalled software.

Ample disk space is always a problem, but purchasing a larger or additional hard disk is not always the solution: Sometimes the best solution is to remove unused programs.

Performing a software inventory requires knowledge and patience to determine the true status of installed software programs, as programs can be partially installed or removed. It is important to accurately inventory your software.

Nebulous but necessary

My most nebulous requirement, but one absolutely necessary to provide a valid recommendation, is equipment usage for both hardware and software.

Computer usage time totals by day, week and month are usually easier to determine than software usage, as multiple software programs are normally used on a single computer. Sharing software among computers can lead to more efficient computer usage.

My final information requirement is a detailed list of the desired hardware and software changes, and how these changes are expected to integrate with the current hardware and software. Justification for each product and change, as well as a manufacturer and/or supplier list for specialty software and hardware, should be included.

Once the client compiles the needed information, they realize why I cannot provide a recommendation in less than two days. It often can take two or more weeks with multiple back-and-forth reiterations before I receive all the information I need.

I will not start working on my recommendations until I have all the information I need.

Because each site is unique, I research all the requested hardware and software products. Next, I verify that the products function together in the manner expected. This means contacting manufacturers, suppliers, users and other sources for information and recommendations about each product, integration with other products, pricing and availability. The smallest glitch can change the whole project.

If I have any doubts, I acquire the

proposed product to make certain it functions as it should.

Unfortunately, many products do not perform as they should. I have found and reported numerous product problems.

Back and forth

If a product does not work, I attempt to find a substitute and recommend the change. My proposal may go to the client many times before I find something that meets their needs.

When I know that all the components will integrate, an on-site meeting with the actual users is required to ensure the recommendations meet the client's needs and expectations. We can also resolve

any conflicts among needs, expectations and reality.

Most changes take place at this meeting because users have different needs and expectations than the person(s) who set the requirements. Changes may require more research, but once a pattern of communication is established, it becomes easier to finalize the proposal.

Can you do the product search and integration yourself? Absolutely. I encourage it. I prefer informed clients.

Just remember, the key to success is knowing who to ask and where to look for information — and not expecting real results by tomorrow.

□ □ □

W.C. Spenn is a networking and communications consultant for Dove Data Systems in San Antonio, Texas. He can be reached at telephone: 210-656-8011.

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Overload Protection: Relay drops out the audio section. Was able to blow the AC main fuse several times on the bench while testing the overload protect.

Clipping indicators on front panel are very conservative. I noted that they would illuminate well before the output signal actually began clipping (10dB left to go.)

The overall construction is well thought-out and should prove easy to repair if a problem does occur.

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Use Care to Buy System

by Jim White

PLYMOUTH, England When Plymouth Sound installed a Sonifex HDX2000 digital audio playback system, I encountered several difficulties that made it unlike installing any other piece of gear.

Shop around

Before we even began installing the system, we had to specify exactly what sort of system we wanted and to decide what advantages we had to have and what limitations with which we were willing to live.

Three systems were demonstrated to the presenters and myself in our studios

before we settled upon the HDX2000 as the best for our applications. We installed four separate computer systems for news, commercial production and our two on-air services.

Many people in the radio business have a very positive attitude when new equipment is purchased. That it might fail is far from the first thing that comes to mind when new gear is installed.

But with computer systems this is a very important concern. It is very important to ensure that if any one component fails that this does not lead to total loss of station output.

Stations fortunate to have a sufficiently large budget, a fully redundant system

should be considered; for the rest of us other means have to be found.

At Plymouth Sound, we kept two CD players in the on-air studio for music. For news, the news reader suffices. For commercials, we made certain that the on-air studio has access to the commercial production playback system.

Component failures

It is also important to find ways of minimizing the damage that the failure of one or more of the computer components can cause.

Computers are extremely reliable these days, but a hard disk can still fail. If it does, many hours of work can be lost. A digital DAT backup tape is essential to ensure that data can be restored quickly and completely.

As most radio stations use computers in

the sales department or other areas, it is not essential to keep basic spare parts on hand unless you have the funds. In a pinch, one of the back office computers can be cannibalized.

Mains power failures and electric storms can damage both equipment and data so we added a smart uninterruptible power supply (UPS) to condition the mains supply as well as to provide a backup supply.

In the studio

The installation is almost as important as the equipment itself. To the engineer, installing a computerized setup is just another job that management wanted done yesterday, but for the presenters, it will be the everyday working environment for many years to come.

If adding computers to an existing studio, the position of the equipment is determined — to a certain extent — by the space available, the physical size of the equipment, cables, noise and vibration.

There also has been a lot of interest in the effects of continually watching video displays (VDU). We decided that the screen should be to the right of the presenter, along with the keyboard and trackball. There is no reason to stare at the screen for hours on end, so why put it in front of the eyes?

There is also the secondary consideration. The VDU emits interference that is picked up on the microphones if they are placed within a foot of the screens.

VDUs are effected by magnetic fields from loudspeakers, tape recorders and in fact many devices connected to the mains power supply. Two screens cannot be placed next to each other as one interferes with the other. Again a spacing of approximately one foot is recommended.

To avoid delays when installing the equipment, check the distance between all components, screens, keyboards and so forth. Check the cable ducts to make certain enough space for all the extra cables exists. In our case, the VDU keyboard trackball cable had to be extended.

Airflow

Computers require a free flow of air. On the workbench, this is not a problem, but once in the woodwork or in a rack, dispersing the heat can be a real problem.

Remember, in most situations your equipment will be working 24-hours a day. In a "normal" office situation, the system might work hard for eight hours each day followed by a six hour break before a timed backup occurs in the middle of the night.

One often overlooked problem is noise vibration from the cooling fan, hard drive and other components. Site the computer as far away from the microphone as possible. Also consider adding rubber or cork shock mounts to reduce vibrations that might pass through the woodwork to the microphone.

Lighting too is very important. It does no good to look at a VDU and only be able to see a light or window reflecting in the screen.

Unattended overnight operations require a backup system with a program detector connected to the output of digital playback system. If the detector notes 10 seconds (or less) of silence, a tape machine starts playing back a two-hour prerecorded program tape. In the meantime, an auto-dialer rings four people who have two hours to get to the studio before the tape ends.

□ □ □

Jim White is chief engineer at Plymouth Sound in Plymouth, Devon, England.



TRYING TO MAKE SENSE OUT OF DIGITAL AUDIO SYSTEMS?

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It's not easy trying to understand the conflicting claims made by different manufacturers when you're buying a Digital Audio On-Air & Production System, whether a single, multipurpose Workstation or an integrated, multiple studio setup. At one end of the spectrum, you're faced with a wide variety of simple "Cart Machine Replacements," and on the other, products whose complexity confounds even the most seasoned broadcast engineer.

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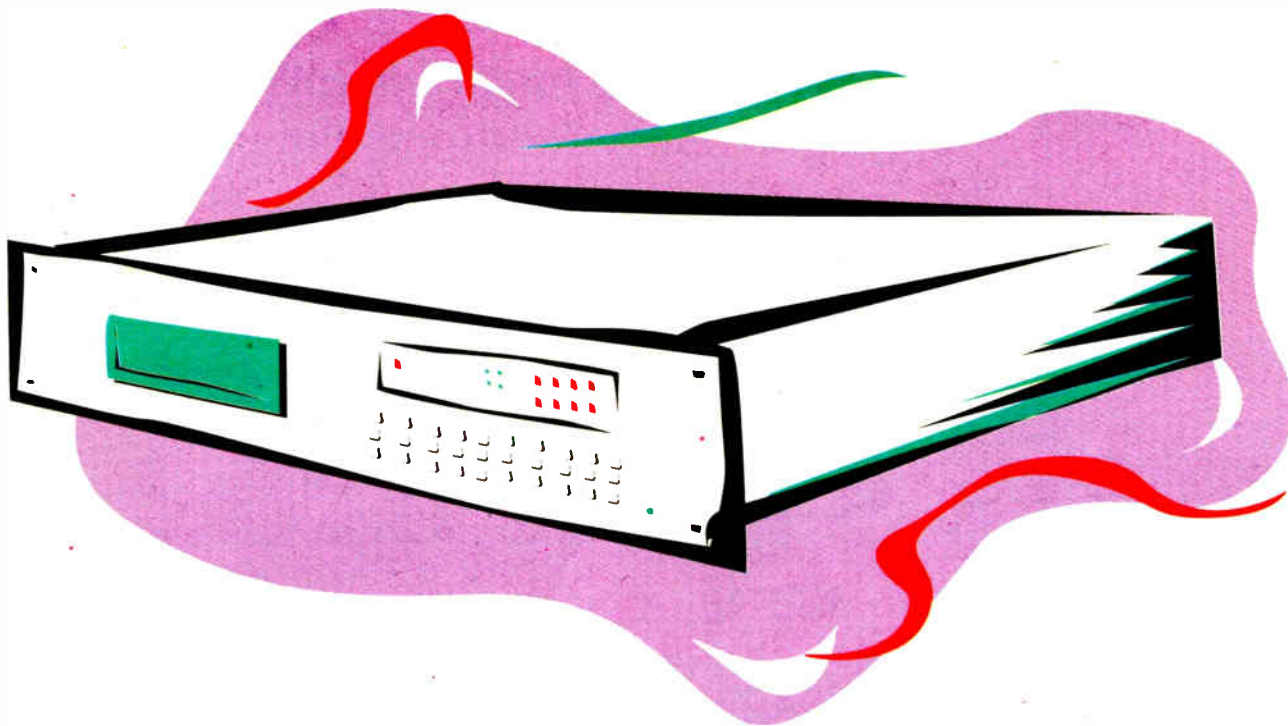


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Radio's
Fibber McGee
and Molly
See page 49

Your Resource for Business, Programming & Sales

Rescue Your Morning Show from Snow

by Mark Lapidus

WASHINGTON You've done this, haven't you? Bad weather hits town and you kill your morning show to do the school and business closing announcements because that is what radio stations are supposed to do.

Recently a program director called me and asked, "What about school closings on snow days? ... We did a terrific job on closing announcements last winter and still had a down book."

Snow days

Before I could say a word, I had this flashback: The snow started around 9 p.m. The moon was shining brightly and the trees looked pretty. I drifted off to a sweet sleep with a smile, knowing that four (count 'em, four) TV meteorologists predicted less than an inch. The overnight jock woke me up at 1 a.m. to inform me brightly that if I didn't get to the station, he would be doing the morning show.

"How could this be?" I asked naively. "The weatherguys all said one inch." His reply was short, "That's what you get for believing what you see on television." Click went the phone. Through the blizzard I drove, arriving at the station at 2:30 a.m. I was going to get some sleep on the couch in the lobby. Only one problem: The phone kept ringing all night with questions from kids about school closings. I did not get a wink of sleep and on top of that, had to do a typical "school closing" morning show.

At the time, I thought it was the right thing to do. Now I know there are options.

The overnight jock informed me that if I didn't get to the station, he would be doing the morning show.

First, I still believe that in smaller markets it is an obligation for local stations to deliver snow closing information. It is in the vital interest and safety of the community that radio do its part to keep people informed.

However, what happens in markets when you have 10, 20 or even 30 radio stations delivering the same boring information? This gets even more ridiculous when that same market has two all-news stations and three local TV stations with morning news shows. Your competitor is going to get smart and put something entertaining on or figure out a better way

to deliver the information.

Let's examine how to do closing announcements more effectively and then how to do closings off the air.

Research

What does your audience want? To analyze just how much your audience wants school closings from your station, do a little research. The first question is usually easy: What percentage of your listeners are in school or have kids in school? The second may require a quick survey during your next auditorium test or focus group: What percentage of those listeners will get that information from your station? They may get it from another radio station, TV newscast or even the school system. Finally, ask this: After you get the school closing information, do you keep listening, change the station or turn off the radio? Answers to these questions will shape your approach.

Play the percentages. When you announce school closings, do the largest systems or counties the most frequently. This sounds obvious, but few stations do it. Even in top-10 markets, you will hear stations lead with small private schools when they could be announcing an entire county that

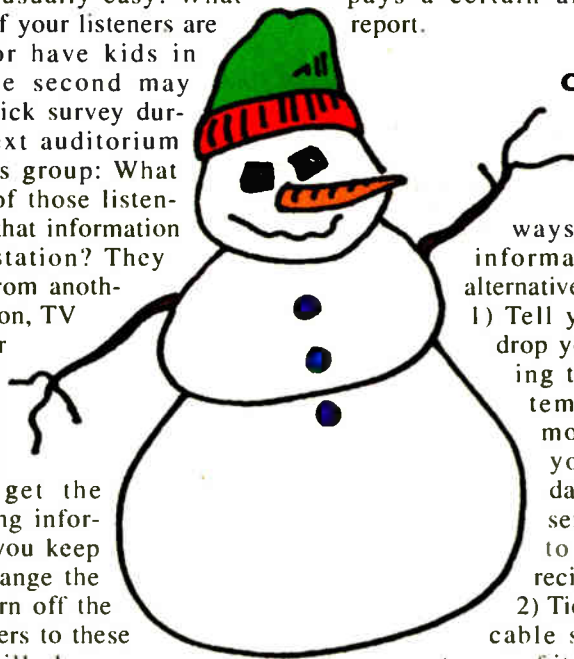
have no news person, have a part-timer come in whenever snow arrives. For easy access, have a book prepared with all the passcodes used by the schools.

Sponsor snow! Yes, if you are going to do school closings, there are a lot of people willing to be associated with this community service. Work out an advance agreement so that a sponsor pays a certain amount for each report.

Options

For those who opt for the "no closings" approach, there are still ways to deliver the information. Try these alternatives:

- 1) Tell your audience to drop you an e-mail listing their school system. Any given morning it snows, you'll have your database ready and send group e-mails to each system's recipients.
- 2) Tie in with the local cable system and promote one of its unused channels for scrolling school closings. Have your audio put on the channel. Promote it heavily on-air. For



example, "For all school closing announcements watch Continental Cablevision channel 52 ... a public service from WWWW and Continental."

3) Set up your interactive phone system with the closings and just plug the number. The only limitation here is on the sheer volume of calls the system can handle in four hours.

4) Promote your sister AM or FM station. With a duopoly, you may want to put the community flavor more on one station than the other: "We're non-stop rock machine this morning ... so for the latest school closings, listen to our AM sister station at 1230 on the AM dial."

5) Ignore it. Yes, that is always an option. If you play cool jazz 24 hours a day with little personality and no promotions, odds are good nobody's turning to you for school closings anyway.

Most stations have been taking the same approach to snow closings for years without ever stopping to take the temperature of their listeners. Find out what the listeners want and then give it to them. If you decide to stop doing snow announcements on-air, explore alternative options. Most importantly, devise an updated plan.

Don't allow the next blizzard to hit without knowing whether it will help or hurt your ratings. And by the way, isn't it time to put a new couch in the jock lounge?

□ □ □

Mark Lapidus is the director of marketing for Liberty Broadcasting. Reach him care of RW.

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Focus on Client's Unique Qualities

Part VI

by Ty Ford

BALTIMORE The "pearls of wisdom approach" unveiled in the previous article of this series — you know, where you walk into the client's office and he or she rattles off one big, beautiful 60-second piece of copy — doesn't always happen. So this time, I'll get into some of the extraction procedures that will help you get what you need to help the client.

New market

But first, be aware that advertising is not working like it used to, especially for the

local and regional client. The "Walmartization of America" has decimated the future of many an independent small-business owner. I'm not picking on any one company. Where there once were half a dozen hardware stores, two or three lumber yards and some paint stores in an area, there are now two or three Home Depots or Hechingers. The big players aren't totally heartless. Most of the time they attempt to hire from the companies they will potentially be putting out of business.

Car dealers have their own problems, the biggest of which is that, in most

metro areas, there are too many places to buy a car and too many places to buy the same car. However, automobile manufacturers may be starting to see the light. In this market, a major manufacturer recent-

ly announced the closing of several dealerships so that the remaining ones could survive.

In many ways, the consumer market has

started to look and behave like a commodity market; soy beans are soy beans, sugar is sugar, jeans are jeans, cars are cars, and the only important thing is the price.

As the consumer market continues to move in that direction, differentiation among products becomes increasingly difficult. I'm not saying that there are no differences — although pure logic would indicate that the more products of a certain type there are, the more similar they must be — I'm saying that there is enough stuff on the market to put the consumer in a state of critical input overload.

Making choices is difficult when you're blitzed. And because we invest a lot more of ourselves (ego, pride, satisfaction, vanity and sex-appeal) in our purchasing choices, most of the things we buy and the act of buying itself mean more to us than soy beans and sugar.

This is the big picture, and many have lost sight of it. Even though the consumer market is behaving like a commodity market, the consumers might not really want it that way because it robs them of the highly valued and very personal emotional component. Oh sure, consumers like the fact that excessive supply pushes prices down, but when the company they work for reorganizes to get better profit figures, (and blows them out to get those figures) they get upset. Then, of course, you can ask the really wicked question: What if consumer confidence is down because this commodity-market approach has robbed the consumer of the emotional component of the purchase?

Differentiation

OK, maybe that's pushing it, however, your biggest challenge is still to help your advertisers find unique ways to position themselves apart from the competition. If your client is in the retail or service industry, adding services or raising the quality of service can work. Paying more attention to the customer, finding out what changes he or she would like and implementing those changes is also a good start. Yes, it takes time and money, but that's what happens in a crowded market.

As it pertains to radio advertising, if everyone is selling the same stuff the same way, the same old copy approaches cease to work. Focus on how the client's product or service is different from whatever else is on the market. Notice that the following questions address buyer-based feelings and emotions.

Is the product or service easier or more convenient? Is it a better value? Is it expensive, but worth it? Is it safer? Does it feel better? Does it taste better? Does it make things smell better? Does it make you feel more important? Will it make you more comfortable? Will it make you more of a man, or more of a woman? What does owning it say about you?

If you cannot answer several of these questions about the product or service in detail, you do not have a case. If you go into the market without a case, you will get clobbered.

The solution to the problem is to change. Just as you have been able to clean up your spot breaks by eliminating empty ad-speak phrases that cause listeners to tune out, your clients must also cater to the market by changing their approach. Unfortunately, that is the last thing most clients want to do.

continued on page 56 ►

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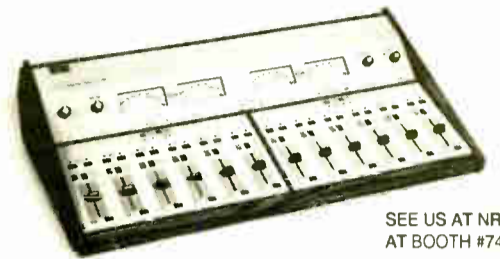
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Inexpensive & Convenient Control

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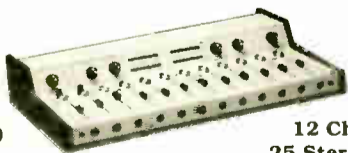
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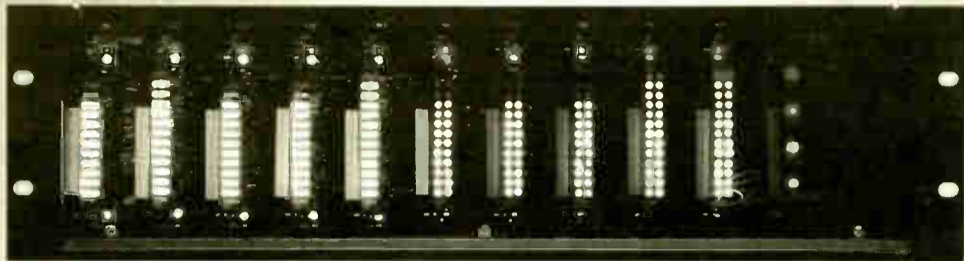
Available through all major dealers

READER SERVICE NO. 172

Products & Services Showcase

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The System 1000 Modular Audio Package

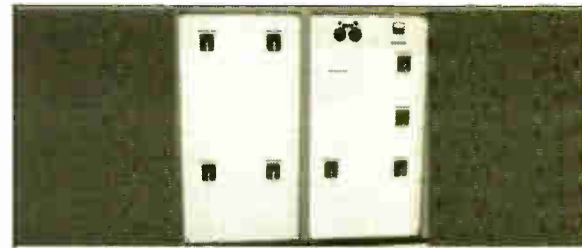
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- Single & Dual Mic-Pre Power DA™s
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- New - Instant Installation

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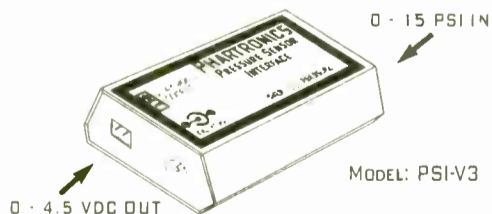
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* Power Mac is a trademark of Apple Computer

READER SERVICE NO. 65

ROOTS OF RADIO

Radio Fun with Fibber McGee and Molly

by Read G. Burgan

LAKE LINDEN, Mich. Jim and Marion Jordan were born and raised in America's heartland. They transported their middle-America values into the living rooms of America and became radio's No. 1 comedy couple — Fibber McGee and Molly.

James Edward Jordan was born in a farm house near Peoria, Ill., on Nov. 16, 1896. He and his three brothers and three sisters moved to the city of Peoria when Jim was 12. He was raised in Catholic schools and sang in the church choir, where, on a cold December day in 1915, he met Marian Driscoll.

Marian was born only a few miles away from the Jordan farm on April 5, 1898. Like Jim she had three sisters, but nine brothers. Marian displayed musical aptitude at an early age. She played piano and violin and sang. Jim, too, possessed musical talent and sang tenor in a male vocal trio that was popular in the Peoria area.

Comedy couple

Jim and Marian put off marriage while Jim sought permanent employment. His heart was in show business and in the fall of 1917 he sang tenor with a vaudeville group called "A Night With The Poets." The group toured a regional vaudeville circuit in the United States and Canada before ending in the spring of 1918 after more than 200 performances.

Jim became a local mail carrier and married his beloved Marian on Aug. 31, 1918. A week later Uncle Sam drafted the new groom. It was World War I. While in the service, Jordan organized an entertainment group that toured military hospitals in France. After his release from the army, Jordan tried a number of different jobs: mechanic in a machine shop, selling life insurance, clerking in a department store. None of these satisfied the restless Jordan and repeatedly he and Marian drifted in and out of the entertainment world as aspiring musicians. They did moderately well, but touring was incompatible with the kind of family life the Jordans envisioned.

In the 1920s, radio was in its infancy and Chicago was rapidly becoming one of the major production centers for the burgeoning radio industry. In 1925, radio station WIBO hired the Jordans for 10 dollars a week to sing on a program called "The Jordans, Marian and Jim." She played piano and both sang.

From 1925 to 1931 the Jordans appeared in a variety of programs on several Chicago radio stations. They continued to dabble in vaudeville and used their radio appearances to announce their vaudeville engagements. During this time, the Jordans began to discover they had a talent for storytelling. Marian experimented with the characterization of a little girl, Jim with a character who told outrageous tall tales.

By 1931 the Jordans were in demand in the Chicago radio community. Both together and separately they appeared in several ongoing series including "Three Doctors," "Mr. Twister, Mind Trickster" and "Kaltenmeyer's Kindergarten." They made guest appearances on "The Saturday Night Jamboree," NBC's

"National Farm and Home Hour" and "Don McNeill's Breakfast Club."

Perhaps the most important step in their professional development was their series "Smackout," which began on March 2, 1931, on Chicago's WMAQ. This 15-minute program was aired Monday through Saturday. Here the Jordans developed many of the characters that they later perfected on their "Fibber McGee and Molly" program. And here they began a lifetime association with Don Quinn.

Quinn was a cartoonist and joke writer from Grand Rapids, Mich. He had a fertile imagination and was a gifted writer.

It was the Jordans and Quinn who together developed the concept for "Smackout."

Tall tales

In this series, Luke Gray (played by Jim Jordan) was the owner of a country store located at Smackout Corners. When customers came looking for an item, Gray was always "smackout" of whatever they wanted.

Marian developed the character of Teeny, Luke's precocious little friend. She also played a variety of other characters including Mrs. J. High Hat Upson,

the widow Wheedledeck and Bertha Boop. Before the series ended, Jim and Marian had portrayed more than 150 characters. McGee's famous utterances, "Dat rat it!" and "Ah, pshaw!" were first spoken by Luke Gray on "Smackout."

Two events combined to enhance the prospects of Jim and Marian Jordan. On Nov. 1, 1931, NBC bought radio station WMAQ. And in 1934 the Tony Wons radio program sponsored by the Johnson Wax Company was discontinued.

Looking for a new vehicle to promote its products, the Johnson Wax Company

continued on page 50 ▶

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Colorful Characters on the Radio

► continued from page 49

decided to give Jim and Marian Jordan their own network program.

The "Fibber McGee and Molly" program debuted on April 16, 1935, from NBC's Studio 8-H in New York. From the very beginning, Don Quinn was hired to write the series, but the Johnson Wax Company insisted on having total control over both the program's story line and the commercials. Because the company's primary products at that time were auto polish products, the ongoing story line featured a middle age couple touring the country in their car. After four weeks the program returned to Chicago and continued there until 1939.

Fortunately, in the fall of 1935, the Johnson Wax Company decided to promote its new line of floor wax products. On Aug. 26, 1935, the McGees purchased a home in Wistful Vista, thus setting the stage for the format that would characterize the program for the next 20 years.

The McGee home and the constant flow of neighbors, friends and relatives became the focal point of the program. In a recent "Old Time Radio Digest" on the Internet, someone raised the question, "Was 'Wistful Vista' a street or a town?" A good question since the McGees lived at 77 Wistful Vista. The answer is that it was both.

It is difficult to pinpoint what made the "Fibber McGee and Molly" show so successful, in part, because its success was synergistic, one in which the whole was greater than the total of its parts. But each of the parts made an important contribution, not the least of which was the creative writing of Don Quinn who created a ever increasing stable of wacky characters.

The Jordans would meet with Quinn on Fridays to explore ideas for the next week's show. The process would continue through the weekend. On Mondays the entire cast would read through Quinn's script, which was often accepted without

change. On Tuesday evening, the cast would convene in a small conference room off the studio at 5:30 p.m. and read through the script one final time before going on the air for the half-hour broadcast at 6:30



Fibber McGee & Molly

p.m. PST. Occasionally, last minute changes based on cast members' suggestions would be inserted in the script.

Consummate performers

Jim and Marian Jordan were consummate performers. While the name Fibber suggested a character given to telling tales, McGee was much more. He was an inveterate braggart who felt he had the answer to any problem. He invented devices destined to make him a millionaire while solving some of the world's most pressing problems — like the time he invented an automobile ignition lock that ejected the key when it was turned off so that people wouldn't leave their keys in the car for teens eager to steal a car for joyriding. Jim Jordan had a wonderful ability to rattle off long, silly alliterations that would have tangled the tongue of almost anyone else.

Marian, too, was a wonderful performer. She portrayed Molly with an ever so subtle, melodious Irish brogue. She always

had the measure of McGee and was quick to puncture his balloon or predict disaster when he embarked on one of his zany schemes. At the same time she quickly flew to his defense if anyone else attempted to belittle him.

Early in their radio career Molly became adept at portraying a wide variety of characters. On the "Fibber McGee and Molly" program, most of the other characters were played by other actors, but Molly continued and perfected her portrayal of Teeny, the little girl from next door who regularly bedeviled McGee. As a general rule, the character of Molly was never present when Teeny appeared.

There was no practical reason why Marian could not have portrayed both in a radio dialogue, but this helped to preserve the illusion that Teeny was in fact a real little girl with no connection to Marian or anyone else on the program. For some of us, the secret became known only when we saw Marian portray both in one of their motion picture appearances.

In later years the subterfuge was carried even further when the closing announcement delineating the cast of characters stated, "And Teeny was played by ... Teeny." Even today, Marian Jordan's portrayal of Teeny fools listeners. A recent posting on the "Old Time Radio Digest" asked, "Does anyone know who played the little twerp that badgered McGee with, 'I betcha, I betcha.'"

It would be a simplification to say that Fibber McGee and Molly and Jim and

Marian Jordan were simply extensions of each other. But their lives were curiously intertwined. At the end of each broadcast, Jim and Marian would reach out and quietly hold hands. Off mic, they were very private and spent most of their time together at home, raising their children and engaging in favorite hobbies.

Over the years the "Fibber McGee and Molly" program was blessed with a wonderful cast of supporting actors.

The cast

Bill Thompson was only 23 years old when he joined the Fibber McGee cast in 1936. He played several characters through the years, including The Old Timer and Horatio Boomer. But he was best known for his milk-toast portrayal of Wallace Wimple, the classic henpecked husband. Our current concern for spousal abuse blunts the humor of these sketches, but at the time his descriptions of his "big old wife, Sweetie Face" and her constant antics were hilarious. She was frequently throwing him against walls and ceilings while training the sheriff's department in self defense. Wimple's refuge was his bird book and Walter Mitty-like dreams of revenge on his terrible wife. Molly liked to say, "She may have all the brawn, but he has all the brains."

Whimple's wife, Sweetie Face, was one example of Don Quinn's ability to create characters who were described and talked about but never actually heard. Myrt the telephone operator was another. Almost every time McGee made a phone call he would end up saying, "Oh, is that you Myrt? And how's every little thing?" Then he would hold a one-sided conversation with the imaginary Myrt. She was a regular on the program who was played by no one.

Even the announcer played an important role in the program. "Fibber McGee and Molly" was one of the first radio programs to successfully integrate commercial messages into the body of the program. Harlow Wilcox was more than the sponsor's spokesman, he was a regular character in the

continued on page 54 ►

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World Radio History



Fibber McGee and Molly

► continued from page 50

series and McGee would playfully refer to him as "Waxy." Listeners would wait to see how he would manage to slip the sponsor's message into yet another broadcast. On several broadcasts, writer Quinn even made Wilcox the subject of an ongoing comedic situation in which he could no longer pronounce "linoleum." How do you promote a product for waxing floors when you can't even pronounce a key word? It was good for at least two shows' worth of laughs.

McGee's closet

Music played an important role, too. In the beginning of their career, the Jordans sang and played, but did no talking. Once the Fibber McGee and Molly program took hold, the Jordans ceased singing and concentrated on comedy. In 1936, the studio orchestra featured Ted Weems' band and singer Perry Como. Orchestra leader Billy Mills took over the musical responsibilities in 1938. The Mills orchestra included many talented musicians including Spike Jones and pianist Buddy Cole.

During the early years, the program featured a number of vocal groups, but in 1940, The Kings Men male quartet became a permanent fixture on the program. The Kings Men and the Billy Mills orchestra each provided one number on nearly every show. At various times, Darby was under contract to MGM, Walt Disney studios and 20th Century Fox.

McGee's closet was one of radio's

longest running sound gags. People would eagerly wait for McGee to say, "I'll get it for you. It's right here in the closet." Followed by Molly's cry, "McGeeeee ... Don't open that closet." Too late. By the time the words were out of her mouth, the door was open and the fun had begun.

For what seemed like an endless amount of time listeners heard almost every imaginable item tumble out of that closet.

Don Quinn knew how to milk a joke for all its worth, when to subtly change it and when

Don Quinn knew how to milk a joke for all its worth, when to subtly change it and when to let it lie dormant for a while.

to let it lie dormant for a while. The program could go for several weeks without reference to the closet. Sometimes he would change the scene by having one of McGee's visitors open it and then it was McGee himself who would holler, "Don't open that door!" And on very rare occasions, McGee would pull open the closet door to total silence. The proud McGee would then exclaim, "I just cleaned that thing out yesterday." Fortunately, it didn't stay clean long.

The Jordans won many accolades for their portrayal of Fibber McGee and Molly. By 1949, an estimated 40 million people listened to their program. On April 15, 1948, St. Joseph's College in

Collegeville, Ind., bestowed honorary doctorate of law degrees on the Jordans.

As radio began to lose ground to its one-eyed rival, television, the "Fibber McGee and Molly" program was altered from a once-a-week half-hour show to a five-times-a-week fifteen-minute show. The Kings Men quartet, the Billy Mills orchestra and the studio audience were eliminated. The only regulars retained were Arthur Q. Bryan and Bill Thompson, supplemented by supporting guest actors. March 23, 1956, was the last regular broadcast of the McGee program.

However, in June of 1955, NBC inaugurated a bold new network radio service called

their program until September of 1959. Some of these sketches were re-aired in 1960 and 1961 over "Weekend Monitor."

In 1960 NBC proposed that the Jordans once again take up the Fibber McGee mantle for "Weekend Monitor." But Marian Jordan's health had always been fragile. In the fall of 1937 her physician committed a critically ill Marian Jordan to a sanitarium and she did not return to the program until almost two years later, in April of 1939.

During the beginning of that illness, Jim Jordan concluded each program with a special message to his wife — such as, "Hurry back Molly" — until the FCC pointedly reminded NBC that regulations prohibited any point-to-point communication on any regularly scheduled program on commercial radio frequencies. Reluctantly, Jordan dropped his personal messages to his beloved Marian.

As the Jordans pondered NBC's offer in 1960, a physical examination revealed that Marian had an inoperable ovarian tumor. Marian Jordan died on April 6, 1961.

It seems poignantly fitting that Jim Jordan died on April 1, 1988, at the age of 91 — surely April Fools' Day is a fitting memorial to one of radio's greatest tellers of tall tales.

□ □ □

For further reading: "Heavenly Days! The Story of Fibber McGee and Molly," Charles Stumpf and Tom Price, *The World of Yesterday*, Route 3, Box 263-H, Waynesville, NC, 28786 1987.


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

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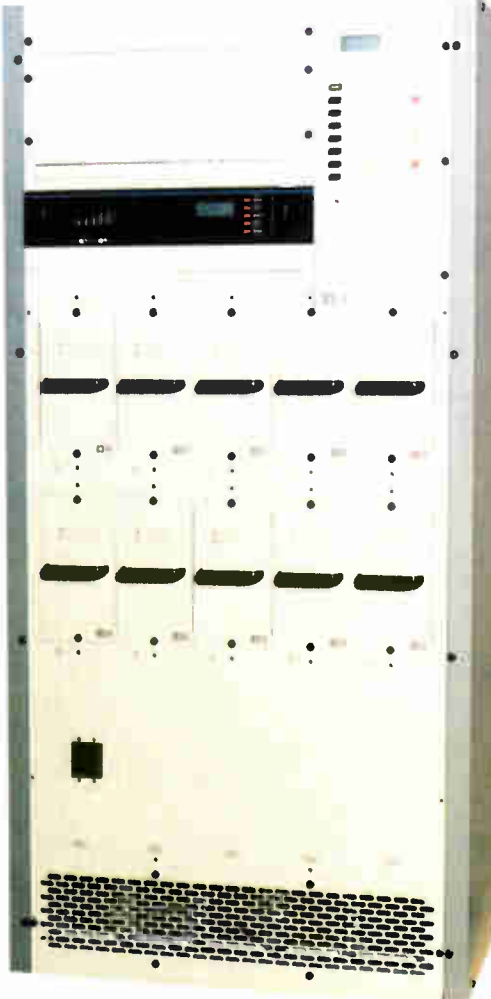
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Radio Shopping Program Debuts

LOS ANGELES The first regularly scheduled radio shopping program, "The Shopping Show," debuted on stations around the country in December 1995. The weekly two-hour show features a variety of products available at discount rates and an 800 number, which is available to customers seven days a week.

"The Shopping Show" is produced by the Gourley Group and was created to generate additional revenue for talk radio stations on the weekends. Each station airing the weekly broadcast receives a percentage of the purchase price for each item sold. Customized programs are available, which can be tailored by stations to include local advertisers.

For further information on becoming an affiliate or marketing a product contact Bob Gourley at 310-519-1324; or circle Reader Service 38.

Radio America Launches Weekly Politics Program

WASHINGTON Radio America Network, a new, 24-hour network specializing in news, talk and documentary programs, announced the debut of "Countdown '96," a weekly politics program.

Countdown '96 offers in-depth, behind the scenes coverage of the 1996 political campaigns. The program includes exclusive interviews with candidates for president, the House, the Senate and gubernatorial races around the country, as well as interviews with campaign managers, political consultants, analysts, pollsters and the media.

The program is hosted by Republican Bill Pascoe, political director of the American Conservative Union and Democrat Paul Goldman, former Democratic State Chairman of Virginia.

For more information, contact Maura Whalen at 202-408-0944; or circle Reader Service 28.

KD Kanopy Offers Stronger Canopy

WESTMINSTER, Colo. KD Kanopy's best selling canopy, the Kd Majestic, has a newly designed frame, which, according to the company, can be assembled by two people in 30 seconds. The canopy weighs 48 lbs. (10-foot by 10-foot frame) and is 40 percent stronger than their steel framed unit.

The frame is made of high-tensile aluminum with fiberglass-reinforced DYNIDIOM fittings. The one-piece, scissor-like design has no loose parts or ropes.

KD Kanopy tops are treated to be water resistant, fire retardant and UV guarded. These tops come in an array of colors at no additional cost and can be customized with graphics. All KD Kanopies come with free heavy duty carry bags and stakes. Available sizes: 8' x 8', 10' x 10' and 10' x 20'.

For more information call 800-432-4435 or 303-650-1310; or circle Reader Service 109.

Nelson Creative Radio Introduces New Radio Shows

LOS ANGELES Denny Nelson, founder of program syndicator Nelson Creative Radio announced the nationally syndicated

broadcast of two new shows: a two-hour music and romance show airing five nights a week hosted by Dionne Warwick and a weekly, issue-oriented two-hour live call-in show hosted by Beverly Todd.

"Love Notes with Dionne Warwick" debuted Dec. 12 on more than 200 stations across the country. The show combines love songs with interviews by Warwick of legendary artists and Warwick's advice on romance. It will air from 10 p.m. to midnight, Monday through Friday. "Love Notes" will be distributed via satellite from NCR's studios in Oceanside, Calif., or via cassette tape to stations unable to receive satellite programming.

"Talk To Me," featuring Todd, debuted Dec. 16 and will be broadcast live via satellite from 9 a.m. to 11 a.m. Saturday mornings. The live call-in show is concerned with youth at risk and communities confronting the gang problem.

For more information contact Claudia de Llano at 310-273-2060; or circle Reader Service 54.

L2 Sound Effects Presents New Release

SANTA MONICA, Calif. L2 Sound Effects announced the release of "Platinum Sounds for the 21st Century," which features award-winning selections from the sound library of Hollywood sound designer Frank Serafine.

"Platinum Sounds for the 21st Century" is available to the public for the first time in an exclusive 10-disc set. Each disc contains sound effects from well known Hollywood motion pictures, TV shows and new media productions organized into eight categories including animals, electricity and static, industrial, metal, science fiction, supernatural, transportation and water.

For a limited time, "Platinum Sounds for the 21st Century" can be purchased by calling 800-779-L2FX; or circle Reader Service 125.

Country Oldies Show

LONG ISLAND CITY, N.Y. The two-hour weekly "Country Oldies Show," hosted by Steve Warren, features music from 1965 to 1985 with some older and some newer. The program is two hours long and each hour contains a full 59 minutes of programming, which can be 100-percent walkaway or cover assigned segments with local spots, promos, etc.

The Country Oldies Show is delivered on high quality cassette or DAT and is recorded in real time. Programming is not dated and simple, detailed cue sheets accompany every hour.

For more information call 718-786-3703; or circle Reader Service 149.

Radio Team Keeps Listeners Healthy

TAMPA, Fla. Deborah A. Ray, an immunologist turned nutritional talk show host, and her husband, Donald Carrow, a physician know as talk radio's "medical maverick," team up on the air on "Here's To Your Health."

"Here's To Your Health" is a nationally broadcast radio talk show that deals exclusively with health, medicine, wellness and nutrition.

Ray interviews guests and highlights new health-related products and services, while, several times a week, Carrow hosts an open line forum and answers questions from the listening audience.

For more information on "Here's To Your Health," Deborah Ray or Donald Carrow, call 800-283-1522; or circle Reader Service 123.

Hawaiian Radio Program

SAN DIEGO, Calif. "Ports of Paradise," a weekly, hour-long "radio postcard" offering listeners traditional and contemporary Hawaiian music,

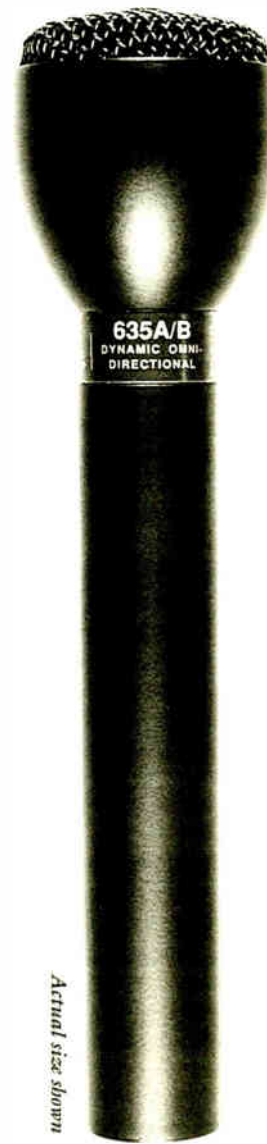
historical facts, amusing stories and information is available for radio stations nationwide.

Launched in mid-1995, the program offers recordings of entertainers from Hawaii and other South Sea Islands, from the 1920s to the present, and averages 15 songs per hour.

Show producers provide promotional support to stations and six minutes of commercial time to sell within each show. Ports of Paradise is available on a barter basis.

For more information, call Ports of Paradise at 800-223-2564; or circle Reader Service 53.

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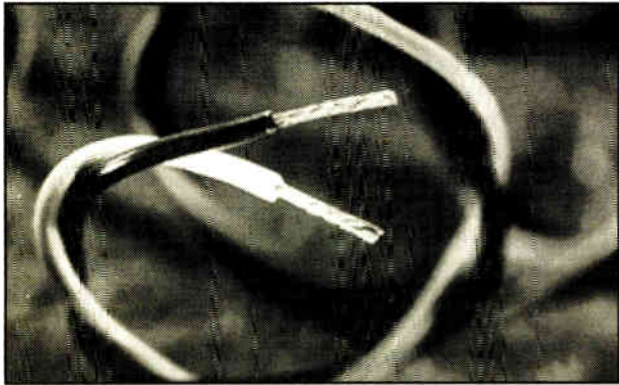
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World Radio History

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MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional



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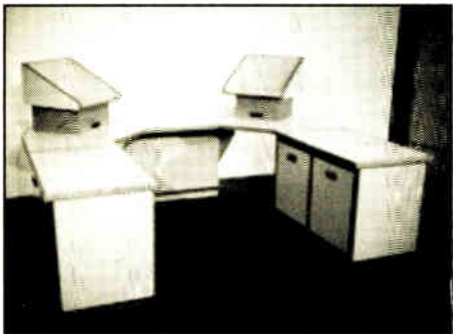
A series of high-performance speaker cables from Belden Wire & Cable are available for plenum installations. Belden Brilliance plenum speaker cables are highly flexible, two-conductor open twisted pair cables featuring high-conductivity ETP copper.

The cables are available in gauges ranging from 18 AWG to 12 AWG and the conductors are highly stranded for maximum flexibility.

For more information from Belden Wire & Cable, contact the company in Indiana at 800-BELDEN-4 (235-3364); or circle Reader Service 78.

Digital Broadcast Studio Furniture

The Digital Orbit Series (DOS) studio system from Spacewise is designed for two digital PC systems and an audio



mixer console and incorporates the Digital Turret system. The system is available in a choice of colors and custom variations are routinely incorporated.

Standard features include heavy duty rack rails and fully adjustable shelves; access ports for wiring and computer cabling; ventilation ports; backplane sheathing; ready-to-mount punch blocks; and under dual locking access doors.

For more information from Spacewise, contact Peter Palagonia in Arizona at 800-775-3660; fax: 520-579-9877; or circle Reader Service 128.

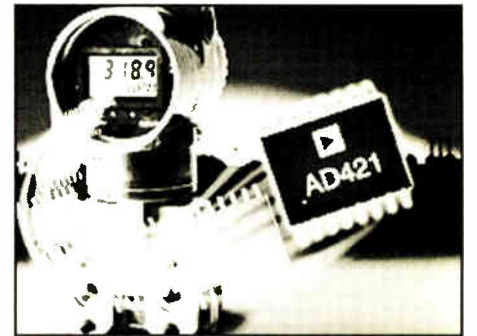
DAC For Smart Transmitters

The AD421 loop-powered digital-to-

analog converter (DAC) from Analog Devices is designed to meet the needs of smart transmitter manufacturers with industrial control applications. The monolithic 16-bit DAC sends 4-20 mA signals to a microcontroller to control a variety of digital processing functions.

The AD421 is housed in a 16-pin package and includes an on-board voltage regulator that can provide +5 V, +3.3 V or +3 V outputs as well as on-board +1.25 V and +2.5 V precision reference voltages.

For more information from Analog Devices, contact the company in Massachusetts at 617-937-1428; fax: 617-821-4273; or circle Reader Service 124.

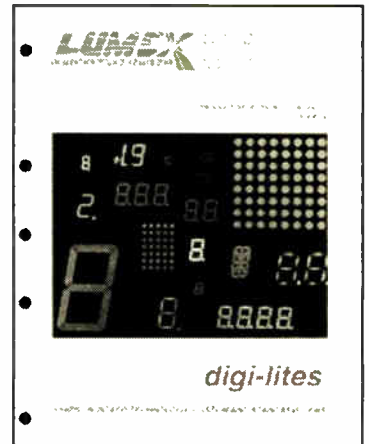


LED Digi-Lites Catalog

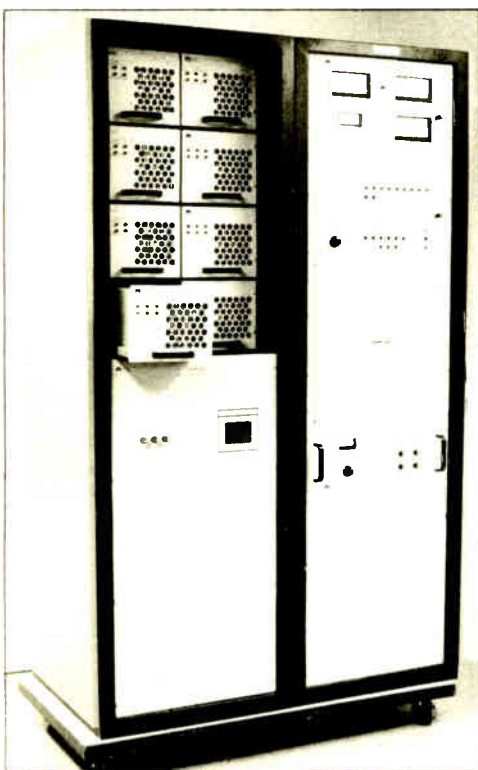
A 32-page, full-color product selection guide for electronic end-product manufacturers from Lumex Opto/Components presents data and color photos of more than 210 LED digi-lites based on chips-on-board technology.

In addition, a number of chips-on-board displays on ceramic, flex and PC boards are presented as examples of custom items available to users.

For more information from Lumex Opto/Components, contact the company in Illinois at 847-359-2790; fax: 800-944-2790; e-mail: lumex@aol.com; or circle Reader Service 59.



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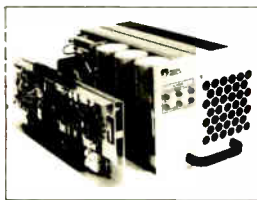
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Focus on Uniqueness

► continued from page 46

Initial attempts at suggesting change can result in the 1-2-3 death blow: 1) "We've always done it this way!" 2) "It always worked before." 3) "Because the problem isn't us (the client), it must be you (the radio station)." If you can successfully bring the client through the denial stage and you are there to help forge a new position in the market, you will have that client for a long time. The sad truth is that not everybody is going to be able to make it to the next level.

I don't want to get too fatalistic. On the brighter side, you probably have clients who have made the right adjustments but might be held back by bad copy and production. We have already covered how to spot bad copy and how to stop it if it is coming from your own people. Remember the importance of involving the client. People like choices. Asking if the client has any preferences as to copy, delivery, style, dialogue, monologue or humor can improve the relationship.

This is also a good time to head off problems. Making your client look good has always been a part of the

territory. If your client has had a history of coming in with spots that are certified tune-out makers, let the client know you have gotten calls from listeners who find the spots objectionable and be prepared to offer alternative solutions as soon as you give the bad news.

At Hedquist Productions, Jeff Hedquist's solution to this problem has been to collect a reel of great spots for different types of clients. When presented with a really bad idea, he suggests going to the reel to show the client what a good spot can sound like. It's a great idea.

The bottom line is that every spot that causes tune-out drops your ratings and your profitability. In the beginning of this series, I showed how radio has lost power and position to the advertising agencies. If you see the regaining of that power as part of your survival or success, you have to go for it.

□ □ □

Ty Ford may be reached via e-mail at Tford1010@aol.com or at 410-889-6201. He will be speaking on this topic at the Country Radio Programmers Convention in Nashville, Tenn., on Feb. 29.

radio.sys

MARKETPLACE

The following marketplace compiles current products from computer-based systems for automation, live assist, production, traffic and music scheduling. Companies included are those who responded to a request from Radio World for information. Circle the appropriate Reader Service number or contact the companies directly for information on their products.

A-Ware — MusicMaster is a fast, flexible music scheduling and inventory system used by thousands of radio stations worldwide. It uses an advanced scheduling algorithm to improve average turnover control and interfaces with most automation and traffic systems.

For information, contact Joe Knapp or Scott Wirt in Wisconsin at 414-521-2890; fax: 414-521-2892; e-mail: aware@execpc.com; or circle Reader Service 83.

WWW site: <http://www.execpc.com/~a-ware>

ABC-Digital — D-Radio is a totally integrated digital on-air system, combining an all-digital mixer with a fully assignable virtual console, automation system and networked information system. It melds digital audio and information technology in a futuristic yet user-friendly package.



For information, contact Matthew Holliday in Australia at 61-2-333-2609; fax: 61-2-333-1413; e-mail: holliday.matthew@a2.abc.net.au; or circle Reader Service 81.

WWW site: <http://www.abc.net.au/>

AEV — The Aurad System 2 Virtual Radio interconnects up to 64 external sources (CD, MD, DAT, etc.) with a digital hard disk system for digital recording and on-air transmission of jingles, advertisements and music tracks. It makes use of ISO/MPEG Layer II (MUSICAM) compression and can be operated in live-assist or full automation modes.

For information, contact Luca Bergonzini in Italy at 39-51-950249; fax: 39-51-950201; or circle Reader Service 14.

Blue Group — Phonebyte, Sportsbyte and Newsbyte recorder/editor/playback systems are customized for specific tasks. Each system features rich, easy operation and automatic recording when interfaced with hybrids.

For information, contact John Timm in Florida at 813-531-4487; fax: 813-531-4897; or circle Reader Service 102.

Broadcast Electronics — AudioVAULT, Broadcast Electronics' digital studio system, provides control for live, automated or satellite stations. The versatile AVAir interface makes complicated live radio easy, with seamless

transitions to automated mode.

For information, contact Bob Arnold in Illinois at 217-224-9600; fax: 217-224-9607; e-mail: bdcast@bdcast.com; or circle Reader Service 177.

WWW site: <http://www.bdcast.com/>

CBSI — Premier is a second-generation, Windows-based traffic and billing system powered by the CBSI DeltaFlex Traffic Engine. It includes copy rotation, flexible order entry, a cut-and-paste clipboard, user-defined contract confirmations, interactive manuals and enhanced operator supervision and security.

For information, contact Bob Lundstrom in Oregon at 541-271-3681; fax: 541-271-5721; or circle Reader Service 181.

Dalet — Navigator is the Dalet software solution for live assist and complete on-air automation. On a single screen, users load logs, prepare segues, record voiceovers and display scripts. The user-friendly Windows environment simplifies operations to a click of the mouse.

For information, contact Steve Kelley in New York at 212-370-0665; fax: 800-257-123; 100437.1536@compuserve.com; or circle Reader Service 84.

Datacount — The Datacount Accounts Receivable and Traffic Scheduling (DARTS) system is a PC-based software package available in single, multiuser or network versions, as well as an entry-level version that encompasses logging, traffic, commercial management and sales reporting.

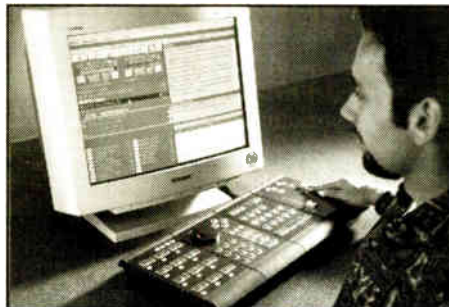
For information, contact Debbie Hamby in Alabama at 334-749-5641; fax: 334-749-5666; e-mail: dcount@opel.mind-spring.com; or circle Reader Service 10.

dbm Systems — CartWorks digital audio and automation systems are designed to help stations entering the digital age. Features include Windows-based screens that operate like traditional broadcast equipment, apt-X audio, instant help and many others.

For information, contact Jeff Corkren in Mississippi at 601-856-9080; fax: 601-853-9976; e-mail: 71071.2166@compuserve.com; or circle Reader Service 29.

Digigram — With the increasing use of compressed digital audio at radio stations, many broadcasters have selected Digigram PCX technology, based on the ISO/MPEG compression standard. Today, with more than 8,000 systems installed, PCX cards are the basis for a large range of radio applications developed by Digigram OEMs.

For information, contact Christelle Berger in France at 33-76-52-47-47; fax: 33-76-52-18-44; e-mail: 100605.317@



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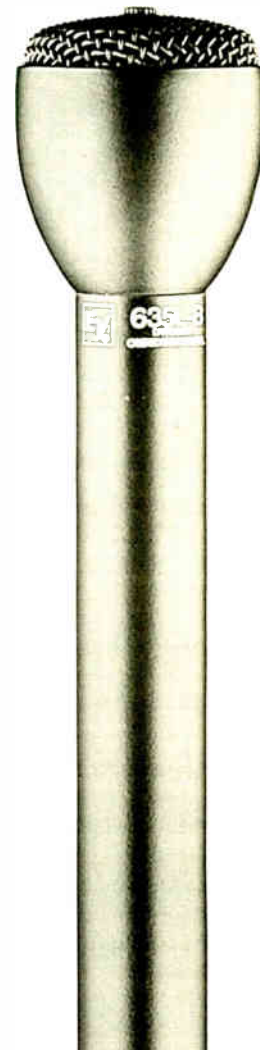
World Radio History

compuserve.com; or circle Reader Service 74.

Digital Link — The ADAS is a Windows-based digital automation system that provides digital CD-quality audio in any format or sample rate with unlimited autonomy. It can take audio from any source, including satellite, phone or traditional audio sources such as CD, MD and DAT.

For information, contact Tony Rodriguez in Florida at 305-888-4883; fax: 305-888-0812; or circle Reader Service 89.

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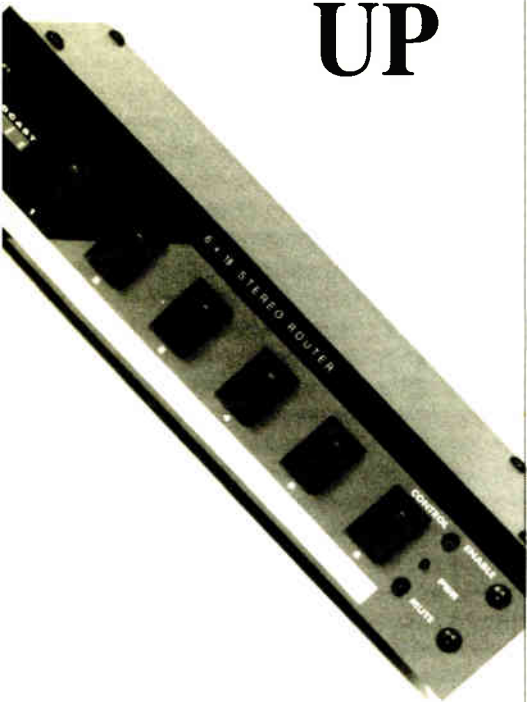
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Eela Audio — The CAPS computer-based system is designed for modern broadcasting. It uses ergonomically designed custom-made keypads for control and the software is written to make the system easy to use for presenters.

For information, contact Fred van Eijk in the Netherlands at 31-40-510-484; fax: 31-40-570-482; or circle Reader Service 2.

ENCO Systems — The DAD486x Digital Audio Delivery system provides complete on-air management for both live-assist and automated formats, as well as production recording and editing. With a free-form layout, the DAD486x lets individual users create, store and recall their preferred operational parameters and screen layouts. It can be configured for use as a standalone workstation or as part of a network.

For information, contact Larry Lamoray in Michigan at 810-476-5711; fax: 810-476-5712; e-mail: 72604.774@compuserve.com; or circle Reader Service 148.

Euroson America — Track Scan is an easy-to-use system for playing CDs in the live environment. No keyboards or computer commands are needed to operate it; music is simply selected with a bar code reader pen.

For information, contact Jon Taylor in New York state at 516-273-4200; fax: 516-273-4240; or circle Reader Service 206.

Fairlight USA — The Dali-2T is a DSP engine designed for two-track editing and mastering, based upon Fairlight's 20 years of experience designing digital audio workstations. The system is suited to radio and TV studios producing high-quality two-track sound for advertising and voiceover recording.

For information, contact Wayne Freeman in California at 310-287-1400; fax: 310-287-0200; or circle Reader Service 174.

ITC — The DigiCenter digital audio management system is an open architecture system providing intelligent electronic interfaces to traffic, programming, production and on-air stations. The central audio library with noncompressed audio files can exchange files with many editors.

For information, contact Charlie Bates in Illinois at 309-828-1381; fax: 309-828-1386; or circle Reader Service 106.

Maycom — The DigiCorder is a portable digital recording, editing and communications device. It stores up to four hours of audio to a credit-card sized hard disk or EPROM flashcard. It also has built-in facilities for ISDN lines or the GSM wireless network.

For information, contact Hein Shillings in the Netherlands at 31-481-377-740; fax: 31-481-377-525; or circle Reader Service 88.

Micro Technology Unlimited — The Windows-based MicroSound digital audio workstation can play back up to 100 tracks simultaneously with unlimited, nondestructive edit adjustments, making it ideal for audio for video, project and recording studios, radio, TV, CD mastering and multimedia.

For information, contact Robert B. Davidheiser in North Carolina at 919-

870-0344; fax: 919-870-7163; e-mail: infor@mtu.com; or circle Reader Service 64.

WWW site: <http://www.mtu.com/>

Orban — Orban offers the DSE 7000 digital sound editor, which was created specifically for radio production. The easy-to-use, fast editor features time-compression and expansion utilities, as well as networking capabilities for connection with direct-to-air systems.

For information, contact Howard Mullinack in California at 510-351-3500; fax: 510-351-0500; or circle Reader Service 127.

OSC — Version 2.5 of Deck II is a complete software-based recording studio for Macintosh. It features 999 CD-quality racks, full MIDI and digital video synch, as well as built-in effects, including EQ, delay, pitch shift, time stretch and noise cleaning.

For information, contact Tommy King in California at 415-252-0460; fax: 415-252-0560; e-mail: sales@oscm.com; or circle Reader Service 98.

Otari — RADAR is a hard disk multi-track recorder that configures as an eight, 16- or 24-track recorder/editor. Its remote has dedicated transport and edit buttons. RADAR View allows active display of track names, audio, meters and production parameters.

For information, contact James Goodman in California at 415-341-5900; fax: 415-341-7200; or circle Reader Service 130.

Power-Link Software — Power-Link processes traffic and music schedules for digital audio systems. Features include data conversion, editing, event verification, music merging and more.

For information, contact Richard Rowland in Oregon at 503-857-9293; fax: 503-857-9294; e-mail: power@mind.net or 75561.3405@compuserve.com; or circle Reader Service 150.

PR&E — Pacific Recorders & Engineering offers the ADX digital audio production system.

For information, contact Mike Dosch in California at 619-438-3911; fax: 619-438-9277; e-mail: sales@pre.com; or circle Reader Service 132.

Register Data — Register Data Systems offers The Phantom, a complete digital audio system for recording, scheduling and play back of commercials, liners, promos and other audio items.

For information, contact Russell Nelson in Georgia at 912-987-2501; fax: 912-987-7595; or circle Reader Service 112.

SADiE — The Octavia system is designed to serve the growing demand for affordable yet powerful digital audio workstations in the post production and multitrack markets. This modular system can be expanded as required in term of storage, processing power and audio I/O channels.

For information, contact Jeff Boggs in Tennessee at 615-327-1140; fax: 615-327-1699; or circle Reader Service 137.

Siemens Audio Inc. — The AMS Neve AudioFile from Siemens Audio is a top-of-the-line nonlinear audio editor, offering a wide range of practical features combined with speed of operation, compatibility with other audio and video equipment and optional integration with

the Logic Series of digital consoles.

For information, contact Chirs Pelzar in New York at 212-949-2324; fax: 212-450-7339; or circle Reader Service 13.

WWW site: <http://www.ams-neve.com/>

Sonifex — The HDX2000 Sound Screen hard disk broadcast automation system is a Windows-based, ready-to-run package providing on-air and newsroom audio and text, twin-screen playback, for a fully networked operation. It is available as a complete system or in modules.

For information, contact Marcus Brooke in England at 44-1933-650-700; fax: 44-1933-650-726; or circle Reader Service 33.

Studer Digitec — NUMISYS radio automation systems provide a scalable and affordable solution for covering complex DJ needs as well as large organizations. Numerous media (hard disk, CD, CD-ROM, MO), advanced editing, on-air operations, ISDN transfer and archiving modules make NUMISYS one of the most complete systems on the market.

For information, contact Emmanuel Mouchez in France at 33-1-34-80-87-00; fax: 33-1-34-80-87-79; e-mail: 100673.2224@compuserve.com; or circle Reader Service 113.

Synclavier — S/Link 2.0 is a cross-platform audio file translator and high-speed batch file converter for Macintosh. It supports a wide range of multimedia platforms including Windows, DOS, Macintosh, UNIX, Amiga, Atari and professional systems such as Digidesign, Fostex, Synclavier and PostPro.

For information, contact Monica Meagher in New Hampshire at 603-448-8887; fax: 603-448-6350; e-mail: info@synclavier.com; or circle Reader Service 159.

TM Century — The UDS II is an audio management and control system that interfaces with a variety of multi-disc CD players, hard disk audio systems, broadcast networks and computer networks. The UDS II supports all major music and traffic scheduling systems. Designed for live assist with liner notes, break notes, windows for news, traffic and weather, the UDS II can also be set for up to seven days of walk-away automation.

For information, contact John Schaab in Texas at 214-406-6800; fax: 214-406-6890; or circle Reader Service 131.

Turtle Beach — Turtle Beach Systems offers a full line of high-quality sound products for IBM PC architecture computers. The Quad Studio, for example, records four-track digital audio in real time on a Windows-based PC.

For information, contact the company in Pennsylvania at 717-767-0200; fax: 717-767-6033; e-mail: sales@theach.com; or circle Reader Service 208.

WWW site: <http://www.theach.com/>

Videoquip — The DAVE2000 Digital Audio Voice Editor consists of a standard PC card and software, which runs under DOS. The system can easily be networked across any LAN, and files can be transferred via ISDN or POTS. It was developed by journalists for journalists, resulting in an intuitive interface with non-destructive editing.

For information, contact Joseph Costa in Ontario at 416-293-1042; fax: 416-297-4757; or circle Reader Service 104.

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World Radio History

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Taking Advantage of the Open Net

by William Pfeiffer

The Internet. The Information Superhighway. The Infobahn.

You have heard about it, you may even already use e-mail as an inexpensive, nearly instantaneous, means of global communications. But what about the rest of the net? What resources lie in wait for radio professionals?

'Open net'

The answer is far more than one can hope to cover in this brief space.

Outlined here are a variety of resources available on the "open net." In other words, resources that are accessible

through any Internet-service provider, rather than through a particular on-line service.

Obviously there is not room to list here more than a small fraction of the resources the Internet offers, but these are some good starting points for your search of radio-related information.

If you are unfamiliar with accessing Usenet newsgroups or the World Wide Web (WWW), contact your Internet-access provider or system administration for more help.

First off are discussion forums. These are interactive groups of users who carry on topical discussions — called "threads" — with other users around the world.

These forums are carried across the net either via Usenet, a global conferencing system with more than 4,000 topic-oriented forums called newsgroups, or by e-mail.

Forums

E-mail forums — called "mailing lists" — are ideal for users with limited access to Usenet newsgroups or to the WWW; mailing lists make it easy to keep current with what is being discussed in these other forums.

These often require a subscription, which entails sending a request to a central point in order to be added to the discussion. Mailing lists can be either digested, meaning that the articles are compiled into a digest and sent in one piece, or reflected, meaning the articles are distributed individually.

Most, if not all, lists are free to join, however some do have membership requirements. Some lists are moderated, meaning that someone screens all postings before publishing them to the list, others are unmoderated, where all traffic gets distributed to the list.

Here are some of the more popular mailing lists for professional broadcasters:

AIRWAVES is the digest version of the Usenet newsgroup *rec.radio.broadcasting*. A high-volume, moderated group it covers all facets of broadcast radio at the professional level.

AIRWAVES-Select is a headline news version of AIRWAVES. It includes news and information only, no discussion threads.

BROADCAST echoes Barry Mishkind's Fidonet professional broadcast discussion list to Internet.

General discussion

More general discussion about broadcasting is available via *Broadcast-L*. Similarly, *Online@NAB* provides the newsletter of the National Association of Broadcasters.

PBP-L covers play-by-play sports broadcasting, while *Radio-L* covers all aspects of Digital Audio Broadcasting (DAB).

RadioPro is the AIRWAVES "professionals-only" forum. Membership limited to radio professionals and all facets of broadcasting are discussed.

A fairly high-volume group for working air-talent looking to shave ideas about show preparation is *RadioPrep*. Also available is *Radio Rider*, a weekly newsletter for air personalities who use the Internet and computers.

On the technical side, is *Talkin Tech*, a friendly, low-volume list dedicated to radio technicians and engineers, and the Society of Broadcast Engineers' SBE mailing list.

For contact and subscription information for any of these lists, send an e-mail message to *rw-lists@airwaves.com*

E-mail and Usenet forums are text-based architectures. They contain no graphics and are generally read in ASCII fixed-width fonts, similar to a typewriter.

The World Wide Web, on the other hand, uses full-color graphics, formatted text, sound and even video in its presentation. Many Web pages resemble high-quality magazines.

The Web is based on a language protocol called hypertext, which allows users to point a mouse at hyperlinks on a page and immediately transport to another site. It is this ability for instant networking

that makes the WWW such a versatile tool.

The Web is, currently, the fastest growing aspect of the Internet. It is estimated that there are several million Web sites or pages on-line at this time and thousands more being added every week.

Below are some suggested starting points for broadcast professionals delving onto the Web. Many more sites are out there.

The **Airwaves Media Resource Page** — <http://radio.aiss.uiuc.edu/~airwaves/> — is the Web site for AIRWAVES Radio Journal. It includes many broadcast-related links presented in a very colorful environment. Similarly, Dave Biondi of the SBE created **Bnet** — <http://www.broadcast.net/blinx.html> — a nice starting point for radio and TV broadcasters.

Radio Online — <http://www.radio-online.com/> — is one of the best private sites I have seen. It includes programming resources, technical hints, software and more. Plenty of information is available for free, and even more is there for subscribers.



Radio Jobs — <http://radio.aiss.uiuc.edu/~rrb/job.html> — is a free help wanted and positions wanted database for radio employment.

Finally, the FCC — <http://fcc.gov> — has a site that is loaded with regulatory information.

These are but a small sampling of on-line resources available for broadcasters. I have chosen these sites for their ease of use, completeness and/or uniqueness.

If the above sites are not enough to get you started, there are several search engines on the Web, which help you locate sites by searching for keywords or phrases. These sites can return hundreds of interesting locations.

For a list of search engines, send an e-mail message to *search@airwaves.com* with "Search Engines" written in the subject line.

Exploring the World Wide Web requires special software, called a Web browser. The browser is the single most important link in your Web surfing chain. It determines how pages will look.

There are great differences in Web browsers with varying features. The current favorite on the Web in Netscape, but others are also available. Most on-line services now offer Web browsers, but the quality of their resident software can vary from one provider to the next.

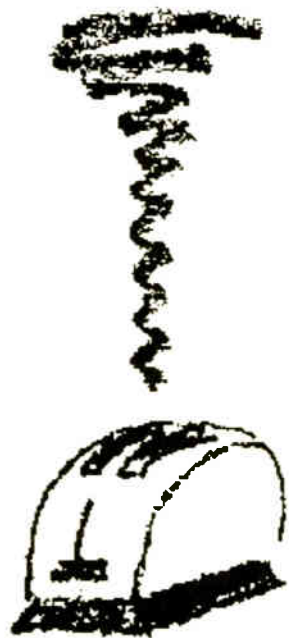
For a more detailed list of Internet and WWW resources for broadcasters, send me an e-mail message and request it. I will gladly forward what I have to you.

□□□

William Pfeiffer edits the AIRWAVES Radio Journal, moderates rec.radio.broadcasting, and is the webmaster for AIRWAVES MediaWeb. He is available for consultation in all matters pertaining to the World Wide Web. E-mail him at either wdp@airwaves.com or wdp@wwa.com

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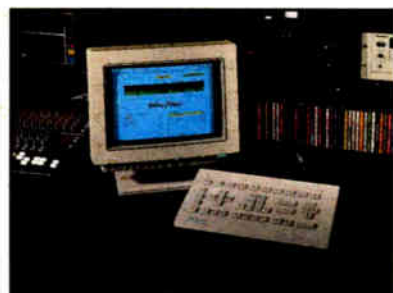
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Soundcraftsmen 450 x 2 MOSFET prof H class pwr amp, 315 w/ch at 40 ohm, 450 @ 2 ohm, 1000 @ 4 ohm bridged, XLR & RCA inputs, gd cond, \$450. RA Cobb, Solid State Rcdg, 1044 Lightfoot Rd, Winauma FL 33598. 813-634-1940.

Want To Buy

Marantz mdl 1 audio console pre-amp, single or pair & mdl 6 stereo adapter. P Chance, 215-574-8147.

McIntosh Mc60 pwr amps (1 or 2), also other vacuum tube preamp, amps, tubes, etc. RA Cobb, Solid State Rcdg, 1044 Lightfoot Rd, Winauma FL 33598. 813-634-1940.

RECORD CUTTING EQUIPMENT. 612-869-4963.

ANTENNAS/TOWERS/CABLES

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w/Switchcraft connectors, mint cond, \$9/ea. B Cuson, Tape-Tracks Recdg Std, 2275 Yargerville Rd, Lasalle MI 48145. 313-241-6695.

ERI 404 isocoupler rated at 10 kW, no tuning required, broadbanded to cover entire FM band, less than 1 yr old, \$1200/BO; Harris 3-circuit tower lighting choke in wx proof steel cabinet, like new, \$150. J Haynes, WOZI, 4 Second St, Presque Isle ME 04769. 207-723-4714.

Jampro 8-bay high power antenna, never opened; Rohn 90' tower, 35' face. R Tangney, 414-283-4430.

Rohn 45 G tower sections, \$125/BO. Rick, KBZO, 1220 Broadway #500, Lubbock TX 79401. 806-763-6051.

Scala 75 ohm FMO antenna, \$200. M Martindale, KVON, Napa CA. 707-252-1440.

ERI 8-bay G5CPM-8C-HW FM antenna, 100.5 MHz, 2.519 power gain, ctr fed rototiller w/3-1/8" interbay & line matching section, input pwr rated at 20 kW w/pop off purge valve & quarter-wave grounding stub, leg mount & anti rotation brackets, 37' total length, avail on ground in Laredo TX, \$12,000. B Miller Earle, KBDR, 815 Salinas Ave #1140, Laredo TX 78040. 210-725-1000.

Andrew 7/8" coax, HJS-50 Air Dielectric, 3.75'. New stock, cut to length! Dielectric 5-bay on 97.1 w/rodomes. 40kW input capacity.
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ERI LPX-2E rototiller low pwr antenna w/1/4 wave shorting stub, mounting brackets, tuned to 90.7 FM, 2 yrs old, \$1800. M York, WKPW, Knightstown IN. 317-345-9070.

Myat 201-060 1-5/8" to Type-N female adapter/reducer, new, \$100/BO. D Michaels, POB 1234, Mt Shasta CA 96067. 916-926-1332.

RCA (Dielectric) 6 bay high power FM antenna on 104.1, \$7500/Best Offer, you pay shpg. Ken or Steve, 907-586-3630.

Shively 6602 4 bay hor on 100.1 MHz, will handle 1 kW input, never used, w/cables, \$1900/BO. D Michaels, POB 1234, Mt Shasta CA 96067. 916-926-1332.

Tower phasers 5 kW (2), you pick up, \$2000 ea. 805-237-6111 or 818-446-3468.

Want To Buy

4-bay FM on 104.9 and/or 103.9. B Campbell, KRIG. 918-333-7943.

Yagi antennas, chnl 4, 5-10 element (2) needed; Rohn SSV, sections 6N - 16N. D Magnuson, 423-525-6358.

AUDIO PRODUCTION

Want To Sell

dbx 166 stereo compressor, \$350. W Gunn, 619-320-0728.

360 Systems 16x16 router expansion unit, \$295; Tascam Syncast w/rack-mount, \$125. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-817-1030.

Dolby A301 2 chnl Dolby A NR, \$250/BO. M Saady, First City Recdg, 213-05 75th Ave, #2L, Bayside NY 11364.

Shure audio master & feedback controller, \$150/both. D Kocher, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18102. 610-776-1455.

Tascam PB32H patch panel, RCA jacks in rear & 1/4 phone jacks in front w/normals, new in box, \$60. J Haynes, WOZI, 4 Second St, Presque Isle ME 04769. 207-723-4714.

UREI 535 stereo rack mount EQ, like new in original box, BO. L Prezant, Record & Play, POB 412, Tuckahoe NY 10707. 718-548-1623.

UREI 535 stereo EQ, \$350; UREI LA-4A, \$475; Lexicon PCM-70 classic reverb, \$1350; dbx 503 expander/comp, \$350; Roland SRV 2000 classic reverb, \$525; Orban 245-E stereo synthesizer/stereo spring reverb, \$175; Altec 1950 vintage EQs, \$190/ea. T Coffman, Rolltop Music Std, POB 17203, San Diego CA 92177. 619-571-5031.

SP 10MK 2A TT w/SH 10B3 base, \$300; Modulation Sciences CP803, Intelligent Pitch Shifter smart shift IPS33, Yamaha digital delay, Orban parametric EQ 622B, JBL stereo 2-way freq divider 5234a (2), Shure 5505 mic, BO. S Whittaker, Event Prod Svcs, POB 36, Athens OH 45701. 614-591-6874.

Symetrix 104 4 line telephone hybrid w/control box & 25' control cable, \$800/BO. Gary, 908-938-4217.

Symetrix 108 8 line telephone hybrid (2) w/2 control boxes, 50' control cable, \$1100 ea or \$2000/both. Gary, 908-938-4217.

Tascam ES-51 synchronizer & (2) ES-50 slaves, creates & syncs SMPTE time code audio to video, digital keyboard & rack mount slaves, w/cables & manual, \$1200/BO. D Michaels, POB 1234, Mt Shasta CA 96067. 916-926-1332.

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Denon DN980F Demo mini disc cart player \$1500.00/ea. 1 available. Call 1-800-622-0022.

Eventide H3000D/SX harmonizer \$1295.00/ea. 1 available. Call 1-800-622-0022.

Eventide H3000DSE-B harmonizer \$2200.00/ea. 2 available. Call 1-800-622-0022.

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Sony PCM2300 DAT rec/play \$1100. 1 available. Call 1-800-622-0022.

Videonics SE1 sound effect mixer \$75.00 2 available. Call 1-800-622-0022.

Want To Buy

Neve-API-MXR mic pres, EQs, effects, compressors. T Coffman, Rolltop Music Std, POB 17203, San Diego CA 92177. 619-571-5031.

AUTOMATION EQUIPMENT

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Format Sentry FS-12C, 48 tray IGM Instacart, (4) R-R ITC PB's, Panasonic CD player, Tandy 1000 SL computer, Tandy DMP printer, Spotmaster RPB cart machine w/tone alert, DRS uninterruptible pwr supply, (2) 6' racks, books & related equip, 2 yrs old, owe \$16,000 but will sacrifice. Terry, 703-647-8493.

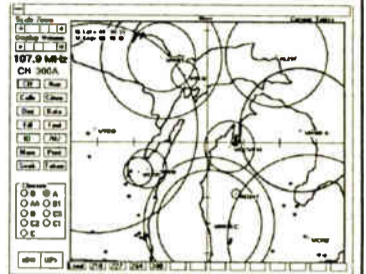
Sony CDK006 jukebox, excel cond w/extra tray, \$1200/BO. Timo, 212-833-4984.

IGM 500 stereo mainframe with AM part, working when removed, manuals & some spare parts, U-haul, Best Offer. J LeSeure, WCMY, 216 W Lafayette St, Ottawa IL 61350. 815-434-6050.

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Want To Buy

Tandy 6000 HD with at least one floppy drive. Mel Crosby, 408-363-1646.

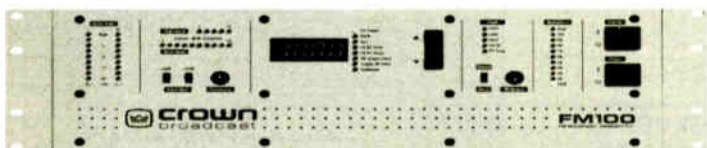
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McMartin B-502 stereo console, 5 pot 10 input stereo in good condition, \$500. J Franks, WHTH/WNKO. 614-522-8171.

Otari 50/50 BIII, 2 track, like new, \$3800; Panasonic 3900 DAT w/control, like new, \$2250; Yamaha SPX900 effects reverb, like new, \$700. J James, 310-824-4846.

Soundcraft Delta Series modular, 16x4x2 mainframe w/(6) mono mic/line, (6) stereo line, (4) sub out & master out modules, 4 yrs old, gd cond, \$2000 +shpg. T Stine, KCGQ, POB 2077, Cape Girardeau MO 63702. 314-335-9099.

Tangent 1202A 12 chnl mixing board, slide pots, reverb, pre & post FX send & return, EQ, excellent condition, \$1000/BO. L Prezant, Record & Play, POB 412, Tuckahoe NY 10707. 718-548-1623.

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Yamaha EMP100 multi-effect processor \$150.00/ea. 1 available. Call 1-800-622-0022.

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LA-4A (2), \$475/ea. T Coffman, Rolltop Music Std, POB 17203, San Diego CA 92177. 619-571-5031.

Orban Optimod 8000A in excel cond, w/manual, \$1795. H Ellington, WKNU, POB 468, Brewton AL 36427. 334-867-4824.

UREI BL-40 modulimiter, cond unknown, \$75 + shpg. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0927.

UREI 1178 stereo peak limiter, \$400; Moseley LPT 10, 10W FM exciter with /new tubes & manual, works very well, \$350; Marti CLA 40 compressor/limiter in vgc, \$100. M Martindale, KVON, Napa CA. 707-252-1440.

CRL 900A AM stereo processor, new; AM stereo package: Motorola 1300 AM stereo exciter, Motorola 1310 AM stereo mod monitor, \$4500. D Myers, WQWQ, 6083 Martin Rd, Muskegon MI 49444. 616-798-2245.

Symetrix CL-150 fast RMS compressor/limiter, \$175. D Kelly, KWPN, Box 84, West Point NE 68788. 402-372-5423.

Cutting Edge UNITY2000I Demo digital FM processor \$5900.00/ea. 3 available. Call 1-800-622-0022.

Cutting Edge UNITY-AM Demo digital AM processor \$5200.00/ea. 2 available. Call 1-800-622-0022.

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Want To Buy

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EV 660 super cardioid mics, gd shape. A Wodel, ILCC Telecomm, 1209 N 7th St, Esterville IA 51334. 712-362-4119.

AKG C414B-TL Fet condenser microphone \$900.00. 1 available. Call 1-800-622-0022.

Audio Technica MT830R mini omni condenser microphone \$75.00/ea. 3 available. Call 1-800-622-0022.

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Sennheiser MZW816 "Blimp" wind-screen \$225.00/ea. 4 available. Call 1-800-622-0022.

Sennheiser MZS816 shock mount \$100.00/ea. 1 available. Call 1-800-622-0022.

Mackie 1202, \$275; EV RE 38 ND mic, \$300. 206-839-9414.

Want To Buy

Sennheiser 421 mics. V Zandt, WGLM, 15 Walnut Hills, Springfield IL 62707. 217-487-7711.

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Topaz 12,000 watt true UPS w/batteries, \$1450; audio/video TV modulator, Blonder-Tonge, VHF channels, \$150. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-817-1030.

Various inductors for ATU/phasor, \$75/ea. M Martindale, KVON, Napa CA. 707-252-1440.

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Henry TIS telephone info system \$500.00/ea. 3 available. Call 1-800-622-0022.

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Belar RFA-2 AM RF amp, new in box on 1340 kHz, with manual, will re-crystal & tune for \$450 or as is for \$425; Belar AMM-3 AM mod monitor, like new, will re-crystal & tune for \$850 or as is for \$825, combine with RF amp, \$1200 re-crystalled or \$1100 as is, like new with manual. J Haynes, WOZI, 4 Second St, Presque Isle ME 04769. 207-723-4714.

Westlake TM-1 time aligned studio monitors with JBL drives, excellent condition, \$1500. B Cuson, Tape-Tracks Recording Studio, 2275 Yargerville Rd, Lasalle MI 48145. 313-241-6695.

Auratone 5-C super cube, \$50. S Bogart, Bogart Productions, 817-467-0158.

Panasonic 920ma TTL monitor, \$20; Panasonic 930 TTL monitor, \$20; NEC FVM125A TTL monitor, \$20. T Wortmann, WJAG, 309 Braasch Ave, Norfolk NE 68702. 402-371-0780.

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Teac A3300 R-R, \$100. B Barrett, KZPI, 485 Dover Glen Dr, Antioch TN 37013. 615-399-8059.

Ampex 300-C-4 vintage 1/2" 4 chnl rcdr w/tube electronics, \$750/BO; various Teac, Sony, AKAI 1/4 trk stereo R-R's, excel analog machines for home/office, \$75 ea. T Houston, Custom Audio, 929 California Ave, Bakersfield CA 93304. 805-324-0736.

Scully 270 R-R stereo play tape machine, \$200; ITC 750 stereo R-R play, \$400; Ampex 440 R-R stereo play, \$150. T Wortmann, WJAG, 309 Braasch Ave, Norfolk NE 68702. 402-371-0780.

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BE 3000A mono PB/delay recorder, rack mount, new, \$500; **BE 3000** (2) mono PB w/tones, \$450 ea. D Kelly, KWPN, Box 84, West Point NE 68788. 402-372-5423.

BE Spotmaster 6100R ten spot, mono, rack mount w/manual, like new, \$600. KMOG, HCR-44A, Payson AZ 85541. 520-474-5214.

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

NEED PARTS FOR NORTRONICS REPLACEMENT TAPE HEADS call SEQUOIA ELECTRONICS
1-(408) 363-1646
FAX 1-(408) 363-0957

Roland DM-80-8 Demo 8-track hard disk recorder \$4500.00/ea. 1 available. Call 1-800-622-0022.

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

Want To Buy

Pioneer 701, 707, 901, 909 R-R, P McCoy, McCoys Recdg, 1232 Brentwood, Richland WA 99352. 509-627-4098.

R-R record & PB tape machines in gd cond, 2-trk or 4-trk. M Wodlinger, 941-262-1118.

Scully 100 16 trk, will pay up to \$2000. B Watkins, Tip-Toe Recdg. 513-825-1186 aft 8PM EST.

Tascam 122 cassette decks. V Zandt, WLGm, 15 Walnut Hills, Springfield IL 62707. 217-487-7711.

Magnecord or Telex 1021, needs amp deck in working cond. J Greman, KJAM, 1015 S Egan Ave, Madison SD 57042. 605-256-4514.

REMOTE & MICROWAVE EQUIPMENT

Want To Sell

Marti STL-8 xmtr on 947.0 MHz, type accepted, factory recond in 1992, \$800 + shpg; Belar RFA-1 FM RF amp tuned to 92.7, cracked meter but otherwise OK, \$250 + shpg. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0927.

TFT digital telemetry unit 7610-C & 7610-R, \$200. B Barrett, KZPI, 485 Dover Glen Dr, Antioch TN 37013. 615-399-8059.

Burk TC-8 remote control, 8 telemetry channels, 8 status channels, \$900. L Highby, KNGN, RR3 Box 44A, McCook NE 69001. 308-345-2006.

Corporate Computer CDQ2000E stereo music codec encoder \$1850.00/ea. 1 available. Call 1-800-622-0022.

Decibel DB438-2-C 6 Element dual yagi, boom connector frequency range of 450-470 \$386.10/ea. 1 available. Call 1-800-622-0022.

R.E.America A8720 stereo tie line encoder w/RS232 1200 baud card installed \$1950.00/ea. 1 available. Call 1-800-622-0022.

R.E.America A8730 stereo tie line decoder w/RS232 1200 baud card installed \$2450.00/ea. 1 available. Call 1-800-622-0022.

Avcom SCS 200 sat receiver, continuous tuning, 4 presets, discriminator-processor, new, \$350; C.A. C-Band LNA 50 dB gain 3.7 tp 4.2 GHz, 6 mos old, \$50. B Barrett, KZPI, 485 Dover Glen Dr, Antioch TN 37013. 615-399-8059.

Zephyrus 300 series with 304 main-frame, 322 stereo audio demodulator, 383 fifteen function tone decoder, 391 sat subcarrier receiver, \$100 +shpg. L Collins, WJYY, POB 1923, Concord NH 03302. 603-228-0936.

Orban 454A co-operator, \$400; Orban 424A gated compressor/limiter/de-esser, \$400; Modulation Assoc SCPC freq agile mod, \$2500; Comtech C-band upconverter 250AU, \$995 ea; MCL-TWTA MDL 10657 with new klystron, \$8000; MCL-TWTA (2) mdl 10657, \$5000 ea; Sector Motor SMM3-4G manual waveguide switch, \$750; Gardiner LNA C-band (19), \$75 ea; (2) Microdyne SCPC analog sat receiver/demod, \$800 ea; (17) Modulation Assoc BP-73 SCPC analog rcvr/demod, \$400 ea; (22) MicroPhase SCPC analog sat rcvr/demod, \$600 ea; (33) Bcdt Design Group audio router/controller, \$50 ea. T Young, Bible Broadcasting Network, Charlotte NC. 1-800-888-7077.

Andrew 4.5 meter satellite dish, Best Offer. Don Kolbert, 507-282-0910.

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Gentner SPH3A telephone hybrid, \$300. D Kelly, KWPN, Box 84, West Point NE 68788. 402-372-5423.

Marti RPT UHF RPU xmtr, new, tuned, tested, \$1200; **Marti RR UHF** rcvr (rack mount), new, tuned, tested, \$1200; **CA 8**, 7-bay broadband Yagi antenna, heavy duty, \$350 ea; 1/2" lo loss coas, 140' length, new, \$350; **Will-Burt** Hurry-Up expandable mast, new, \$2020. D Myers, WQWQ, 6083 Martin Rd, Muskegon MI 49444. 616-798-2245.

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Aplicaciones TH-02-2 dual line hybrid \$2961.00/ea. 1 available. Call 1-800-622-0022.

Comrex DXR refurbished rack mountable digital codec \$1170.00/ea. 1 available. Call 1-800-622-0022.

Cylink #12842-010 airlink 64 V.11 \$1000.00/ea. 8 available. Call 1-800-622-0022.

Cylink #12842-020 airlink 128 V.11 \$1000.00/ea. 2 available. Call 1-800-622-0022.

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Want To Sell

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Want To Buy

Small production company wants to buy small FM, no combos, dark OK, preferably in Southwest. Write to: R Mickle, CMS, 131 Fairview Ave, Ponca City OK 74601. 405-762-7515.

EMPLOYMENT

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

POSITIONS WANTED

Assistant promotion director w/college degree & 2 yrs exper at a Philadelphia top 40 station seeks employment. Willing to relocate. Eric, 610-497-1275.

Broadcast Technician seeking position at AM radio or TV station, reliable, hardworking, will relocate, FCC general license. Jeff, 818-360-2514.

Hard working AT seeks AT or first PD position in Central/Southern Oregon, prefer country or soft AC. Shawn, 503-664-1491 lv msg.

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R&B DJ w/unique show seeking position, call for demo tape. 1-800-770-7878.

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Computer-literate CE with 8 years experience in high power FM, directionals, RPU, satellite & DCS programming, seeking stable position in top 100 market. S Boucher, 616-722-9606.

Professional announcer for production & on-air, adult formats, southeastern states, 7 years with Voice of America. Alex, 513-777-8423.

Competent broadcasting graduate with positive attitude seeking employment with growing station, have confidence & ambition, willing to relocate & adjust. Kelly, 405-677-0923.

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Commodore Media, Inc. seeks experienced, hands-on Engineer to direct major projects at its 20 East Coast Radio Stations: responsibilities include evaluation of stations for potential acquisition and facilities upgrades. Will be based on NY/CT area to oversee Commodore's 9 station NY Suburban Group. Knowledge of Digital Equipment and computer-proficiency required. Resumes and references to: Personal Director, PO Box 551, White Plains, NY 10602.

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Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a \$15 fee which must be paid with the listing (**there will be no invoicing**). Responses will be forwarded to the listee, unopened.

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Inovonics #706-00 FM stereo generator \$1650.00/ea. 1 available. Call 1-800-622-0022.

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Want To Sell

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Audiopak & Fidelipac carts (100 ea), Best Offer. D Hedrick, Pro-Mix Services, POB 496, Panacea FL 32346. 904-926-8000.

Audiopak blk carts (2000), 3-1/2 to 5-1/2 minute lengths, excel cond, BO, D Fitz, WARE AM, 70 South St, Ware MA 01082. 508-764-4381.

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Radio prod facility deleting classic rock library on 7 & 10.5" reels, \$250 +s/h; empty EIA 7.0 & 10.5" reels, \$35 +s/h. D Pulwers, POB 9523, Alexandria VA 22304. 703-578-3014.

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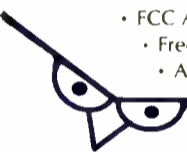
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TEST EQUIPMENT

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Leader #413S EFP/ENG video test signal generator with SID \$1100.00/ea. 1 available. Call 1-800-622-0022.

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Leader 5851V-NS250 PAL vectorscope \$2100.00/ea. 1 available. Call 1-800-622-0022.

Radio prod facility deleting classic rock library on 7 & 10.5" reels, \$250 +shpg. 703-578-3014.

Fidelipac 1000-3.5 Dynamax 3.5 minutes cobalt tape cartridges \$3.00/each. 434 available. Call 1-800-622-0022.

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.

Standard Tape Labs C3007 1/2" reel to reel repro. align. test tape \$50.00/ea. 1 available. Call 1-800-622-0022.

IGM 4216 48 tray Go-Cart (3), \$250 ea; SMC 250 Carousel, \$100; BE 2000 cart machine parts (2), \$25. T Wortmann, WJAG, 309 Braasch Ave, Norfolk NE 68702. 402-371-0780.

Want To Buy

Collector wants stereo station jingles on reels or CD. D Hedrick, Pro-Mix Services, POB 496, Panacea FL 32346. 904-926-8000.

Commercial pre-recorded open reel tapes by RCA, Mercury, Livingston, Westminster, etc. 2-trk only, in-line or stacked heads. P Chance, 215-574-8147.

Bird 43 watt meter, 50W slug & 500W slug with case, tuned for FM, \$275; Bird 8201 500 W 50 ohm RF load, air cooled, \$275. B Barrett, KZPI, 485 Dover Glen Dr, Antioch TN 37013. 615-399-8059.

Fluke 8520A 5-1/2 digit precision bench digital voltmeter, \$295; CM-30 Tek polaroid scope camera for 400 series frames, \$95. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-817-1030.

Miscellaneous spare parts, spring scales, VU meters, cart adj tools, oscillator, dist meter, AC VTVM, patch bays, misc stereo components, Best Offer. L Prezant, Record & Play, POB 412, Tuckahoe NY 10707. 718-548-1623.

RCA clamp on ammeter, \$50; Potomac Instruments FIM-21, \$2800; Sencore mod TR-139 transistor, \$100; Lectrotech mod U-7 vectorscope, \$50; Simpson mod 470 multimeter, \$50; Diehl supertech Mark 5 flyback tester, \$35; B&K mod 3050 auto generator, \$100; Fluke mod 8000A voltmeter, \$50. D Lang, NW Talk Radio, 800-313-5313.

Leader LCG412B handheld NTSC pattern generator \$250.00/ea. 1 available. Call 1-800-622-0022.

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Want To Buy

Hickok 650/800 tube tester manuals & literature, scrolls etc. Sony Studios, Timo 212-833-4984.

TRANSMITTERS

Want To Sell

Collins 5 kW (2), (3) tower phasers, \$150 each, you pick up. KBAI, POB 1150, Morro Bay CA 93443. 818-466-3468.

CONTACTORS BY GELECO

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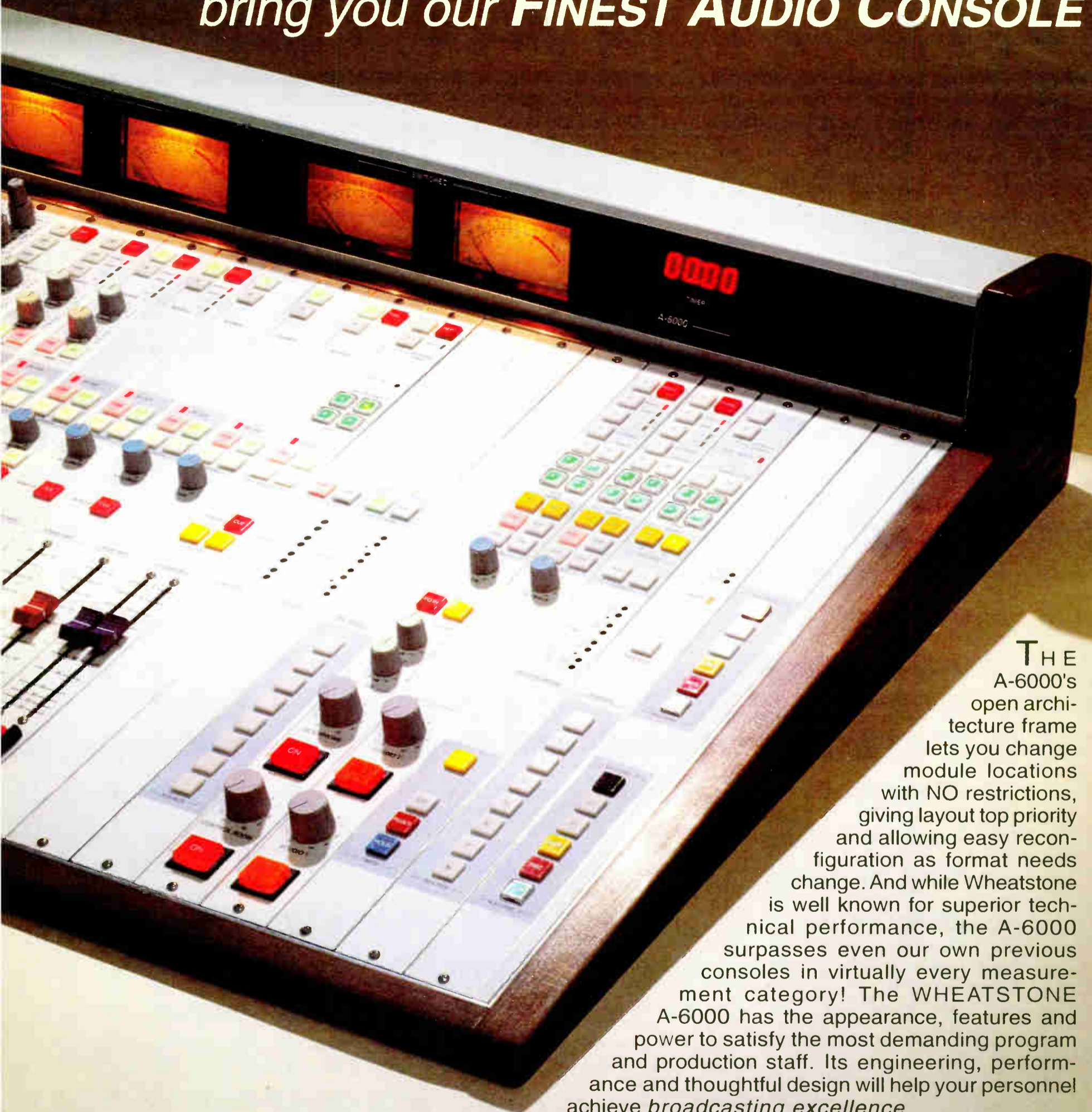
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