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**Car of the Future  
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 page **12**

# Radio World

Vol 20, No 4

Radio's Best Read Newspaper

February 21, 1996

## Congress Rewrites Communications Act

by Lynn Meadows

**WASHINGTON** Whip out the American Express Card.

After a year of debate and months of compromise, Congress passed the telecommunications bill by a massive margin on Feb. 1. It is now safe to buy, buy, buy ... radio stations.

Get set to watch the fun, if the large number of transactions prior to the relaxed ownership rules are a prediction of what is to come. President Clinton was expected to sign the legislation once it crossed his desk.

Radio ownership caps were not totally eliminated as originally sought by the National Association of Broadcasters (NAB) Radio Board. But the days of 20 AM/20 FM national ownership caps are officially over. It is the size of the market that now determines how many stations an owner can purchase.

Other pluses for radio are a simplified license renewal process and an eight-year

license period. Television scored a victory as well. Companies will be allowed to reach up to 35 percent of the population now — a 10-percent increase. But there was less celebrating over the V-chip, promoted to give parents greater control over their children's viewing habits, mandated in the final bill.

The new radio limits are pretty straightforward. In major markets with more than 45 stations, operators can own up to eight stations but no more than five per service. In markets with 30 to 44 stations, it is safe to own up to seven stations but only four per service.

In markets with 15 to 29 stations, group owners are allowed to own six stations tops, with no more than four per service. Owners looking to buy in markets with fewer than 15 stations can own five stations but only three in the same service. No one can own more than 50 percent of the stations in one market.

The NAB Radio Board enthusiastically favored deregulation of the radio industry. Group owners feared that the old caps would leave them competing against new satellite radio technologies with one hand tied behind their backs.

"We are confident that provisions eliminating the national cap and sub-

stantially relaxing the local cap on radio ownership will enable radio broadcasters to compete in an increasingly crowded marketplace." NAB CEO and President Edward O. Fritts said in a prepared statement.

Mike Oatman, CEO of Great Empire Broadcasting Inc., said his company was

pleased that the bill passed but would have preferred the removal of all ownership caps. He said he wondered where the numbers for the new caps came from.

continued on page 3 ▶



**Comsat's Planet 1 Terminal**

(Above) Comsat unveils affordable technology in a laptop — page 3



**Sony's MiniDisc Recorder**

(Left) ABC Radio Networks tests Sony's MiniDisc on-air in New York and will take it on the road to follow the 1996 political campaigns— page 3

## At Large With Susan Ness

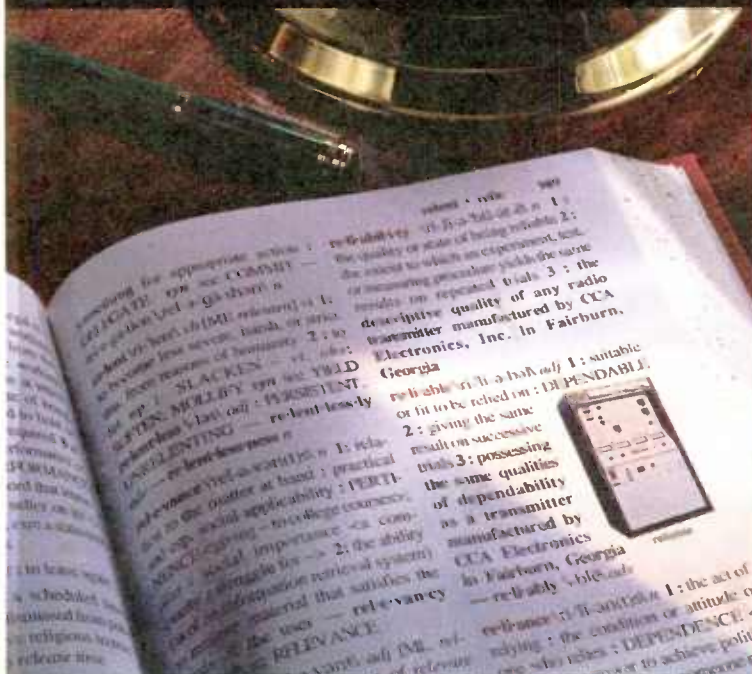
**EDITORS NOTE:** Susan Ness was nominated by President Clinton to the Federal Communications Commission and confirmed by the Senate on May 19, 1994. Ness talked with Radio World Editor in Chief Lucia Cobo and Staff Writer Lynn Meadows about some of the issues coming to a head in the radio industry.

**RW:** Let's have you recollect back to the WRC conference in Geneva this fall. What came out of the conference that would be of specific interest to radio station engineers and owners?

**Ness:** WRC-95 really did not address issues of concern to radio station operators. Although it dealt with many satellite issues, it did not address spectrum for digital audio radio service, since that spectrum was allocated at the 1992 conference.

**RW:** Certainly the WRC was one of them, but you probably have a list continued on page 8 ▶

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## Answers Wanted On DAB

**SAN FRANCISCO** Digital Audio Radio (DAR) field tests were expected to begin before the end of this month, but tough questions about data from DAR lab tests are being asked.

In January, the Electronic Industries Association (EIA)/Consumer Electronics Manufacturers Association DAR Caucus sent a list of nine questions to DAR system proponents.

Seven systems are undergoing tests to help the industry select a standard for terrestrial digital radio. Proponents were asked to answer the following questions by Feb. 22:

1. The in-band, on-channel (IBOC) systems exhibited objective signal-to-noise degradation of reception of "host" analog signals by more than 24 dB. How do you reconcile this reduction in the existing service's performance with the need for continued on page 12 ▶

# NEWSWATCH

## NAB Moves Back Home

**WASHINGTON** Members of the National Association of Broadcasters (NAB) take note. The NAB moved back into its newly renovated building at the end of January.

The phone numbers have not changed, but the new address is 1771 N St. N.W., Washington, DC 20036-2891.

## Calarco Leaves CBS

**NEW YORK** Rod Calarco, vice president of the CBS Owned FM Stations, left CBS on Feb. 2. Radio Group President Dan Mason said he would oversee the FM stations for the next few months.

"Rod has been enormously helpful

during the past two months and I am grateful for the knowledge and insights he has shared with me," said Mason.

Calarco joins the growing list of long-time CBS employees pushed aside or out after the Westinghouse buy out. That list includes Eric Ober, Nancy Widmann, and Anna Mae Sokusky.

## Come On Big Money

**WASHINGTON** Auctions may not be popular with broadcasters, but no one at the Federal Communications Commission is complaining.

As the 13th round of bidding closed, the net revenue for the latest broadband Personal Communication Services (PCS)

auction totalled \$3.3 billion. And the bidders are not faint of heart: only 30 of the original 255 had dropped out.

PCS licenses are expected to be used in a variety of mobile services including new communications devices utilizing small, lightweight multi-function portable phones, faxes and other imaging devices. Bidders are competing for 493 Basic Trading Area (BTA) broadband PCS licenses in markets throughout the United States.

## NPR Goes Digital

**WASHINGTON** Hundreds of public radio stations and program distributors began receiving exclusively digital

satellite distribution last month. National Public Radio (NPR) retired its old analog equipment which had been used since 1979 in its first generation satellite system.

The move followed nine years of consultation with public radio managers, program producers and the Corporation for Public Broadcasting. The new Public Radio Satellite System is expected to help stations provide advanced services and superior sound quality to listeners.

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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.

## The PHANTOM

Digital Audio Automation

The Phantom ends the confusion of automation by keeping everything organized. The Phantom simplifies your daily operations by keeping information such as input changes, voice changes, and clock changes in their own individual schedules rather than in the log. You can leave those liners and other voice drops out of the log because the Phantom will do them for you. The Phantom allows you to date new schedules to begin weeks, months, or even years in advance. When your satellite network informs you that there will be a voice substitution on Thursday, two weeks from today, you can prepare for it *today*.

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.

Call us today to find out how your station can benefit from the advanced technology of the Phantom and the experience of RDS.

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## Bill Passes Congress

► continued from page 1

Great Empire can move forward with selling some stations to a group that exceeded the old limit. Oatman said he thinks the legislation will change the way stations are sold. Eventually, he said, he thinks there will be three and four groups per market, and stations will be sold in clusters. Legislators are convinced the new bill will open up competition to the telephone, cable, radio and television industries. Lawmakers have talked about overhauling the Communications Act of 1934 for 20 years.

"Up to now, we've been regulating in a 'Star Trek' era saddled with 'Gunsmoke' style regulations," FCC Rachele Chong said in a release.

The years ahead promise to be interesting as groups position themselves for the future. Paul Fiddick, president of the Heritage Media Corp. radio group, said what groups do now depends on their past performance. Look for groups who were aggressive with duopolies to be aggressive with the new legislation, he said.

When asked if there were any negative points of the bill for radio, Fiddick said he felt the long arduous process of debate had served the industry well and the bill did not go too far.

Down the line, Fiddick said he thinks radio will resemble the television market of today. In a market where there are four to six television stations, he said, there will be four to six radio operators. The biggest will be powerful, said Fiddick, but not monopolies. Don't look for the radio landscape to change tomorrow, however.

"The legislation may be revolutionary, but the change will be evolutionary," he said.

The telecommunications bill briefly came to a halt last month when Senate Majority Leader Bob Dole (R-Kan.) questioned a section of the bill addressing the extra licenses required for advanced television.

Dole called the giveaway of licenses for digital television "corporate welfare."

"Let us not start a big giveaway program to some of the broadcasters in America who can afford to pay for it," Dole said.

Dole admonished networks for being quick to report on how Congress wastes taxpayer money but slow to cover the billions the government could collect with auctions.

Sen. Larry Pressler (R-S.D.), Senate commerce chairman and proud papa of the telecommunications bill, suggested that spectrum issues be debated in a separate bill.

"I have suggested that we have a grand spectrum debate and that we have a spectrum bill ... I suggest that we go through all the spectrum from the broadcasters' use to other, different uses of it including that held in public and private use," Pressler told the Senate. That does not sit well with many broadcasters including Oatman who said he was concerned about the Dole/Pressler agreement. ☺

# ABC Tests MiniDisc Recorder On-air

by Frank Beacham

**NEW YORK** MiniDisc first entered the radio station as a challenger to the cart machine. Now, with the introduction of a new compact portable, Sony has targeted the venerable cassette tape recorders long used by radio journalists in the field.

Sony's Model MZ-B3 portable MiniDisc recorder (\$899.95 list) is officially billed as "the MD business machine." However, the manufacturer clearly envisions the business of audio journalism as one of this new recorder's primary applications.

The B3 — weighing only 14.3 ounces — breaks new ground as a high quality digital acquisition device for recording long spoken word events and navigating through the material to locate specific "sound bites" or sections. Its powerful search features could be a lifesaver for radio news reporters trying to access a newsworthy sound clip under deadline pressure.

## Mullinack New VP At Orban

by Christopher Nicholson

**SAN LEANDRO, Calif.** Orban recently appointed Howard Mullinack as its vice president of sales and strategic planning.

Mullinack, who has been in charge of the formulation and implementation of Orban's sales strategies worldwide, is now also responsible for the direction and development of the company's range of Optimod and DSE-7000 products and will work closely with Orban's product managers.

Mullinack's promotion is part of an overall strategy to further develop Orban's sales structure on regional levels to create tighter links of communication in expanding markets.

In his new position, Mullinack's goal is to help Orban gain a greater share of the on-air processing and digital editing markets. Mullinack said that Orban is committed to being a major player in the digital studio market. One of his goals is for Orban to expand into a wider range of product areas.

Originally from New York, Mullinack worked in Boston for several years as chief engineer at area radio and TV stations before moving into the area of broadcast equipment sales with Lake Systems.

At Lake Systems, Mullinack was involved in the design of a number of multi-million dollar audio/visual systems, but missed being involved full time with the broadcast industry. He said he considers his move to Orban a natural evolution from his previous jobs. ☺

The B3's low noise floor makes it useful for those who must search through recordings of conferences, court proceedings or telephone conversations. The enhanced clarity is also a significant aid in comprehending difficult-to-understand speech patterns or phrases.

The new MiniDisc portable differs from similar Walkman-type units designed for consumer music recording and playback. Though it can play standard commercial music MiniDisc releases, its feature set focuses on spoken word recording.

For the first time, a pocket-size MiniDisc portable offers a mono mode that allows recordings double the length of the disc. This means 148 minutes of mono can be stored on a 74-minute disc. The standard stereo recording and playback mode is also available.

For quick location of important sound clips,

the B3 employs a dual track marking system. This model offers track marks of two types: regular and special. Both allow the journalist to mark sections of the recording for later retrieval. A single MiniDisc can store 254 of any combination of the two.

By pressing a button on a tiny wired remote control as a recording proceeds, a reporter can highlight a certain sound segment. Later, using the resulting numbered track marks, the machine can quickly search for the preselected clips. Access time is almost instantaneous.

MiniDisc recordings can also be edited by adding or erasing track marks or erasing entire tracks. The tracks, coupled with the B3's position pointer and graphic display, keep the operator from getting lost in what can quickly become an expansive sound landscape.

The Sony B3 is the first MiniDisc

recorder to include a built-in microphone and speaker. The mini stereo mic connector offers 2.71 volts that can be used to phantom power one or more professional quality lavalier condenser microphones.

The recorder also has a fast playback function that allows either 1.6 or 2.2 times normal speed, a feature that dramatically reduces listening time. An optional foot pedal allows remote play, pause, stop and search functions.

As useful as the B3's functions might be on a convenience level to radio journal-



Sony's MiniDisc Recorder

ists, a lingering question remains concerning the sound quality of the MiniDisc format when its recordings are subjected to multiple passes through various data compression schemes.

Though tests have been done with MiniDisc's controversial ATRAC compression system, most have focused mainly on musical material. The B3, which employs a new, improved third generation ATRAC algorithm, is primarily designed for voice recordings.

In order to see how ATRAC performed with spoken word material in a broadcast newsroom environment, ABC Radio Networks cooperated with Radio World to conduct a brief on-air test of the B3 recorder at the network's newsroom in New York City.

Two audio sound clips used on the ABC Information Network's 3 p.m. EST hourly newscast on Jan. 22 were

continued on page 6 ►



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# Score One for Radio When Chips Are Down

**WASHINGTON** We got another big snow storm here in town as this issue went to press, followed by one of those arctic blasts that still has most of the country in a frozen funk.



Of course, the Washington metropolitan area being what it is, the first sign of precipitation falling from the sky led to a run on bread, milk, eggs and video rentals, as well as an insatiable desire for a weather forecast from normally rational human beings.

The staff here at **RW**, I am ashamed to admit, behaved no differently. We all clamored for a Bob Ryan update — Bob being one of our better-respected TV meteorologists in town — and information on NBC 4.

Which led to a funny moment in **RW** history and for the whole reason for this column. Being **RW**, we do not have a television set in the office. So while half the staffers ran to their radios for an update, some of us ran to the communications terminal to look up the latest forecast on the channel 4 home page.

It was no contest. While we tried in vain to find any television station's home page that was not swamped by requests for information, WTOP(AM) here gave three (count 'em) weather updates. At an update every 10 minutes, that meant that we spent roughly 30 minutes trying to log on to home pages

through an obviously overloaded system.

When we would manage to get to the main menus, the graphics took forever to load and sometimes would just sorta fizzle and stop trying. And we've visited these sites before, and they are cool and fast (and we have a fairly powerful computer with a good modem and some of the best Web searching software).

But when push came to shoveling snow, radio delivered without getting overwhelmed by the number of people relying on it for information. Radio is still king in my book for getting info out fast and furious. What's more, the updates on the radio stations are from the same television stations we were trying to log on to — aah, technology.

★ ★ ★

What a great feeling when someone you know is part of a winning team.

It recently came to my attention that our own Tom Vernon has been holding out on us. As you know, Tom works at WXPN(FM) in Philadelphia. And it was awarded two prestigious public radio awards as bestowed annually by the Corporation for Public Broadcasting (CPB).

The two awards are Best Overall Development and Best Special Events and Promotions. The latter award recognizes the collaboration between the Penn's Landing Corp. and WXPN in creating the annual "Singer-Songwriter Weekend." Also to WXPN for the cre-



### Country Radio Cares for St. Jude Kids

**MEMPHIS, Tenn.** The St. Jude Children's Hospital Research Center, founded by the late Danny Thomas in 1962, is the grateful beneficiary of country radio's largesse. "Country Cares for St. Jude Kids" was founded by Randy Owens (seated) and features a series of annual radiothons to raise funds for the hospital. Pictured with Owens are St. Jude's patients and various members of the country music industry at the kick-off for the 1996 fund raisers. The St. Jude Children's Research Hospital treats patients with cancer and other catastrophic diseases without asking them to pay for treatment.

ation of the "New Music Showcase."

The Best Overall Development award recognizes WXPN as the leader among all public radio stations for its response to worsening market conditions for public broadcasting.

★ ★ ★

And last but by no means least, by the time you read this, our own Al Peterson will have pulled down an airshift (on Feb. 7, 2-6 p.m., ET) on the U.S. government's KTRK or "K-Truck" transportable radio station that is being tested at Fort Meade, Md.

The concept of KTRK is to deliver a

fully functional radio station in a single integrated unit to sites where American troops may be located.

Tests are being conducted at 1670 kHz on the expanded band with 5 kW-U, non-directional power.

The inaugural broadcast of KTRK took place on Feb. 5. DX reports — filed mostly by amateur operators — were received during the day and night, with reports as far away as Ontario and Sweden.

Al will provide us with a full report and photos. Look for it in an upcoming issue of **RW**.

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## READERS FORUM

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

# DXing Hobby Evolving With Radio, the Internet

Dear RW,

In your column "The Ins and Outs," (RW, Dec. 27, 1995), you stated, "On a nostalgic note, DXing looks to be on its way out and RealAudio, or Internet radio stations seems to be in." I have to disagree with this statement in part.

While I do not doubt that stations are using the RealAudio system for broadcasting on the Internet, it is not correct to assume that DXing is on its way out.

DXing is still a popular hobby. Since the National Radio Club was started in 1933, the club has experienced its largest membership at the close of 1995. In addition to this, you have other DX clubs which also continue to operate, including the DX Audio Service which is "books for the blind" magazine on tape, all of which have seen gains in membership.

Like all clubs and businesses, the operations and needs evolve. Such is the case with most radio clubs. In the past decade the membership's needs evolved not only to DXing, but also aircheck collecting, trading and collecting of station promo items and documentation of historical information on the industry. There are also a lot of people that have joined just to keep up-to-date with what programs are offered on stations and networks.

As far as the Internet goes, it has only enhanced the hobby and furthered the late-breaking news aspect of DXing. Members use e-mail to alert other members of DX catches and conditions which could result in getting a rare station. We also use the Internet to send information on Courtesy Program Committee (CPC) tests. The National Radio Club's CPC contacts stations to arrange a special test

for DXers during low or non-programming hours, usually midnight to 4 a.m. In the following month, there will be an expected 15 special tests of AM stations.

On one occasion, a clear channel station coordinated its transmitter maintenance so it would be off the air when a daytimer came on the air to test in the early morning hours. The response was overwhelming. The very day that WJDM in Elizabeth, N.J., took to the air at 1660, the traffic was enormous.

During the 1995 NAB convention, within the first hour that KUSA (USA Digital's test station in Las Vegas) took to the air, there were messages all over the Internet. Even when a station forgets to change pattern or power, or if a station is operating under emergency operations during a local disaster, DXers are the first to spot the station on the air. Those that had Internet would call friends that did not have access and forward the information.

Messages on the Internet ranged from a simple "I hear them in Iowa," to detailed program and signal data and even .WAV files of the reception. The DX Audio

**The Internet has only enhanced the hobby and furthered the late-breaking news aspect of DXing.**

Service and National Radio Club also have a Web page at <http://wcoil.com/gnbc/> where you can see reports of AM stations overseas that DXers are listening to in North America. The Internet has not hurt us. It just made us more productive.

I think what most outsiders perceive as a lack of interest in the hobby is actually a change in both the hobby and business aspects at stations. Ten years ago it was not uncommon to write to stations, including a list of program details, and receive a card or letter from the station confirming your reception.

Now, due to budget restraints and staff cutbacks at stations, it is very uncommon to get a QSL card or letter from a station. A 1994 survey indicated a return rate of less than 10 percent. Postage rates also affect DXers, as a single night listening can yield as many as 10 reports. Most DXers now just keep a log of what they hear and don't send letters to stations. I think that because station engineers rarely hear from DXers now, the perception is that the hobby has died.

For those that deal with the facts, the average DXer is male, and is in the 18+ age group. Both income and technical knowledge is average to above average. Thirty percent or more of the DXers buy equipment and accessories that are in the

## The Year 2000 And Beyond

The end of the millennium is a mere four years away, and radio is moving toward it in a rush of new technology. With a wide range of technological innovations clamoring for the attention of today's broadcasters, it is important not to lose sight of the larger picture: serving audiences and customers.

The legacy of wireless is a rich heritage. Early radio transmission gear, as well as acetates, transcriptions and vintage receivers, are reminders of how far the industry has come in so short a time. The legacy they have left behind for broadcasters is a foundation of technology, and has served well as a springboard for the imaginations of subsequent generations devoted to testing the limits of the medium. Mass communications owes a debt of thanks to radio's pioneers.

But the technical onslaught continues. Reported elsewhere in this issue are two stories about two technologies that refine radio's ability to excel in executing its charter. The laptop satphone from Comsat is a tool that gives its user truly global connectivity. Forget cellular, you can be anywhere in the world and still use this little affordable marvel to communicate your news stories, live reporting or whatever.

The portable MiniDisc recorder is another gem that ABC Radio has enthusiastically embraced for its newsgathering efforts. Our ongoing reporting by Frank Beacham will keep you up to date on how the MD performs in the real world.

Radio stations are getting an unexpected boost from General Motors. Also reported in this issue is the news about its slot antenna, that fits between the head liner and the roof of a car (specifically, GM's electric vehicle, the EV1. The antenna, also used on the company's Pontiac Trans Sport, apparently has incredible powers of reception.

Dr. Nagy of GM's research department worked for 10 years to develop the patented antenna. It is designed to receive vertical, horizontal and circular polarization equally well.

But it is not only technology that will carry this industry into the future. More than likely, it is what you do with these technical wonders to enhance your status as a broadcaster that will see you succeed to the year 2000 and beyond.

-RW

above average category. The typical DXer will listen to a talk show, but not call in. Most DXers belong to clubs to further their knowledge on stations, formats and the industry in general.

DXers have knowledge of network and syndicated programs on other stations, and can probably name five or more stations that carry a certain syndicated program excluding their local station, or tell you the format or network affiliation of a station hundreds of miles away from their location.

You also find a lot of blind people in the DX hobby. This is because listening to radio is a primary source of news and information.

Many of the blind listeners participate in the hobby by listening and reporting changes in stations to the club, but very

seldom send written reports or communications to stations because of the cost of postage and the return rate on getting a reply from a station. Some of the blind members of the DX Audio Service are some of the most knowledgeable people I have ever met on what is happening on the AM radio band.

We know that DXing is not a dying hobby; the increasing membership and participation in the National Radio Club and the DX Audio Service counters any claim of declining interest. DXers are a silent group, but are several thousand strong and enjoy listening, recording and logging AM radio stations.

*Frederick R. Vobbe  
National Radio Club  
Lima, OH*

### Anybody home?

Dear RW,

I have been attempting to call the FCC to get an answer to a simple question for over a month.

I couldn't reach anybody for most of December because the government was shut down. When it finally reopened, I couldn't get in touch with anybody at the FCC because of the snowstorm in D.C. When I called yesterday, the commission was closed for Martin Luther King's birthday. When I called today, I reached voice mail (don't these people know how to answer a phone?) When I tried to leave a message, I was told I couldn't because the mailbox was full.

There's a lot more to the government shutdown controversy than just Bill Clinton and Newt Gingrich. It's about a federal bureaucracy that has

gotten totally out of control and totally unresponsive to those it is supposed to be serving. The FCC is a prime example, and it is but a minuscule part of the federal government.

In addition to corporate taxes and personal income taxes, broadcasters are also forced to pay filing fees for everything we do, including a filing fee for our annual ownership reports. Then we have to pay an annual regulatory fee on top of that. What is it we are paying for?

Maybe one of these days I'll be able to reach someone at the FCC who can answer my question, without having to wade through voice mail and/or being transferred to at least six different offices. Yeah, and maybe I'll win the lottery too.

*Larry Fuss  
WDTL-FM  
Cleveland, MS*

# Radio World

Vol. 20, No. 4

February 21, 1996

Editor in Chief.....Lucia Cobo  
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**Next Issue of  
Radio World  
March 6, 1996**

# Recorder Good News for Reporters

► continued from page 3

passed through a B3 recorder before going on the air.

The first clip was a narration by ABC News correspondent John Bascom from the Supreme Court in Washington, D.C. Bascom recorded the report under studio conditions at ABC's Supreme Court bureau and fed it to ABC's Washington bureau over a 64 kbps ISDN line using a Corporate Computer Systems' CDQ-1000 codec. The codec was set for Musicam 24K sampling, 10 kHz response.

Then the feed was sent from the Washington bureau to New York City over ABC's T1 link.

That feed used an Intraplex T1 audio channel bank employing a 128 kbps, 15 kHz APT-X algorithm.

The voice report was then passed through the B3 MiniDisc recorder before being integrated into the hourly newscast. No one in the ABC control room could detect any sonic degradation of the Bascom feed after its pass through the MiniDisc recorder.

The second feed was a telephone interview done in the ABC news room in New York from a flood area in the Midwest. No prior data compression was used on that sound clip.

A pass through the MiniDisc recorder resulted in no perceptible sonic degradation.

After integration into the newscast, the clips were distributed via satellite to local stations over ABC's 128 kbps, 20 kHz SEDAT system. At 3 p.m. the newscast

was monitored on a pre-STL backhaul feed from a West Coast affiliate.

The backhaul used a KU satellite employing Musicam Layer II compression, one channel of a 128 kbps joint stereo feed.

The results of the live broadcast were difficult to judge conclusively due to minor problem with the backhaul feed. The entire feed had a slight raspy quality. However, the clips processed through the MiniDisc recorder showed no apparent difference when compared to the unprocessed material.

Though the tests were very limited, the B3 did not diminish the sonic quality of the news feeds.

"I couldn't detect in the sample of audio we did that there was a noticeable degradation by the MiniDisc," said Bill Holder, manager of technical operations at ABC Radio Networks. "Though it was a quick test, it looks very promising."

ABC news correspondent John Lyons said he could hear no apparent degradation in the audio after its pass through five different audio compression schemes.

"I could hear no difference," said Lyons. "It was indistinguishable from the original."

The only criticism of the B3 from Holder and Lyons was feature related. Both wanted defeatable AGC although they said they could work around it. Holder also wanted switchable mic/line attenuation.

The B3 mic input requires the use of an

outboard attenuator to feed a line level source.

Holder found MiniDisc so promising that he suggested doing further testing in a wider range of recording environments. Lyons said he would be comfortable

using it for his stories.

He quickly got his chance.

Lyons is currently evaluating a Sony B3 and a Denon DN-80R portable MiniDisc recorder on his 8,000 mile "Rolling Across America" tour to small towns. Lyons' daily reports are part of ABC News' pre-election coverage. Radio World will report his experiences with MiniDisc in a follow-up story. ☺

## New Laptop Satphone

by Frank Beacham

**NEW YORK** A six-pound portable telephone that will allow dial-up voice, fax, data and paging communications from anywhere on the planet has been unveiled by Comsat Mobile Communications.

Called Planet 1, Comsat's new personal satellite communications system will allow single phone number roaming in a seamless, global network that blankets the earth. Regional service is scheduled to begin in June with full global coverage available by mid-1997, the company said.

The NEC-built terminal — which resembles a typical portable notebook-sized PC — will be available mid-year at a cost of \$2,995, a price dramatically lower than any previous satellite telephone. Usage will cost \$3 per minute.

"This is going to change the whole nature of global personal communications," said Bruce L. Crockett, president and CEO of Comsat. "This affordable new service will deliver a reliable communications tool for global business professionals and anyone whose needs are not currently serviced by cellular or telephone systems."

### Broadcast applications

One target group is radio and television broadcast journalists, said Chris Davis, vice president of personal communications at Comsat Mobile Communications.

"The audio quality is very high because the service is digital," he said. "It's very natural (not mechanical sounding). Audio quality on Planet 1 will be comparable to toll quality phone service which is about three kilohertz."

Broadcast applications include voice reports from remote locations, off-air operational communications and short message services like e-mail, fax and paging. Planet 1 service, said Davis, is separate from Comsat mobile broadband services which currently offer broadcasters 7.5 kHz service for higher fidelity remotes with more expensive and elaborate equipment.

The new Comsat service will provide secure digital communications channels using high-powered spot beam technology available on Inmarsat-3 satellites. Spot beams are "hotter" than traditional global beam coverage.

Such beams allow smaller equipment to be used because they focus a greater concentration of power onto the earth's surface and are extremely spectrum-efficient. Because they provide for frequency re-use within each beam, air time costs are dramatically reduced.

The beams can be re-positioned over land mass areas where there is the greatest demand for services.

### Rollout by region

The first of five Planet 1 Inmarsat-3 satellites is scheduled for launch in March. As the satellites are placed in orbit, a geographic rollout of Planet 1 service will begin by region. The first region to be operational will be the Indian Ocean, followed by the Eastern Atlantic, Western Atlantic and then Pacific.

Each Inmarsat-3 has five high power spot beams providing up to 2,200 circuits. The satellites are designed to relay bi-directional signals between strategically-located land earth stations, a country's telephone system and a large number of mobile terminals. The Planet 1 network integrates different levels of service usage including global roaming, voice mail, short messaging, call forwarding and Internet connection. The voice rate is 4.8 kbps and the rate for Group 3 fax and Hayes modem compatible data is 2.4 kbps.

Subscriber identity module (SIM) cards are used with the terminals to increase system security and allow consolidated billing for cellular and satellite services.

"The SIM card offers two levels of security," said Davis. "There's a PIN that's used to get access to the terminal, much like a bank ATM. Then there's an encryption algorithm that's sent over the satellite so that the earth station and mobile terminal are exchanging information before the user is allowed access."

Comsat said it will begin taking orders for the Planet 1 terminal in February. The unit consists of a single package which includes electronics, antenna, handset and lithium ion battery pack. The uplink power is four watts. Talk time on a single battery is 1.5 hours. Standby time is about five hours.

"This is the logical product to follow that 20-plus pound terminal that could be characterized as luggable," said Crockett. "We're now down to truly portable communications. The next step beyond the year 2000 will be a handheld."

In order to operate the Planet 1 terminal, the user simply has to point the lid of the terminal toward the sky. An LED illuminates when the terminal locks to the signal. Another LED alerts the user as to whether he or she has a waiting message. The terminal can be used either indoors or out but must be able to "see" a satellite in order to work. It cannot operate while in motion. ☺

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World Radio History

# Ness Focuses on Public Interest

► continued from page 1

of accomplishments you are proudest of since you started as a commissioner.

**Ness:** WRC-95 was an achievement. The successful outcome was not apparent until the last day or two. I am proud of the way in which U.S. government and the industry members of the delegation worked as a team to further U.S. policies. I am especially pleased with the progress that we made in finding common ground with other nations on spectrum allocations for new technologies and services. The efforts expended at this Conference will serve us well at WRC-97 and beyond.

I am also proud of the commission for taking major steps to introduce competition across services wherever possible. We have made an effort to streamline our regulations and to reduce or eliminate them when real competition has taken hold. This is not just talk; this is action. We review each service to determine whether the regulatory structure makes sense in today's marketplace. We examine whether there is a less intrusive, more market friendly way of achieving the same objective. But first and foremost, we want to make sure that our rules work for the benefit of the consumer.

As part of the Reinventing Government effort, our bureaus have conducted top to bottom reviews of regulations and procedures, resulting in significant streamlining of procedures and paperwork reductions. I am very proud of the commission staff.

Of course, I am extremely proud of the way that the commission has implemented our auction authority for the benefit of the public. We have dramatically reduced the time it takes to assign licenses and have ensured that the licenses go to those who value them the most and who will most rapidly deploy service to the public.

**RW:** Satellite Radio is a big topic. We are curious when you think that will take effect and if it will be auctioned.

**Ness:** I do not have a crystal ball. However, I expect to see a digital audio radio service draft item sometime late spring. As with so many other items in progress, the DARS rulemaking was delayed by the furlough.

In the meantime, we have allowed DARS applicants who choose to do so to commence construction of satellites prior to the issuance of any service rules or licenses. However, they undertake such construction entirely at their own risk. Our order makes it very clear that any expenditure of funds will have absolutely no bearing on the outcome of our rulemaking proceeding.

The Omnibus Budget Reconciliation Act included a requirement that the commission auction an additional 120 MHz of spectrum below 3 GHz. The satellite radio service band is located below 3 GHz. Although we allocated 50 MHz for DARS, in our service rulemaking proceeding, we ask whether the public needs 50 MHz of satellite delivered digital radio, when it already receives CD quality audio channels delivered by cable and by DBS. Fifty megahertz represents two and a half times the amount of spectrum occupied by AM and FM radio broadcasters. How many channels are needed and is this the most efficient use of that spectrum?

**RW:** If the answers to those questions are "no," might there not be a satellite radio?

**Ness:** I firmly believe that we will authorize DARS service. The marketplace will determine whether this is a service that the public wants.

**RW:** You mention auctions. We are curious about the ramifications of auctioning

Commissioner Susan Ness is one of three designated FCC Commissioners on the Federal-State Joint Board charged with addressing universal telephone service issues. Ness is especially interested in spectrum management both domestically and abroad. To that end, she served as the FCC's lead representative at the 1995 World Radiocommunication Conference (WRC) in Geneva, Switzerland.

Prior to her appointment, Ness was a senior lender and then group head for the Communications Industries Division of American Security Bank. Ness' involvement in radio dates to her undergraduate days at Douglass College when she produced public affairs and foreign language programming for WRSU Radio.

The commissioner received her juris doctor, cum laude from Boston College Law School and later, a Masters in Business Administration from The Wharton School of The University of Pennsylvania.

spectrum. Right now, when you give away spectrum, it is in the "public interest, convenience, and necessity." What happens when you sell that spectrum?

**Ness:** First, we are not selling spectrum. We are auctioning licenses for a period of 10 years. The spectrum still belongs to the American people. It is a national resource. Licensees must use the spectrum in accordance with the rules of the commission. So that licensees are able to respond effectively to a rapidly changing marketplace, the commission has introduced greater flexibility in the permitted uses for auctioned spectrum. I imagine that we will continue to do so in the future. That is one of the topics to be discussed at our upcoming spectrum *en banc*.

**RW:** With both the encouragement of the development of new services and the emphasis on new technologies and deregulation where appropriate, is there a chance that the oldest band, the radio



Commissioner Susan Ness

band, might get pushed aside? A lot of owners outside of the major markets are small operators and not heavily funded. How are they going to resist the lure of the megamergers? And how are they going to compete with some of these other better funded technologies that have come out to lure away their consumers?

**Ness:** Broadcasters have a distinct advantage — it's called localism. When our broadcast system was first designed in the early 1920's, it was decided to license stations to serve local markets rather than to serve the entire country or a large region. And, in contrast to the approach taken in other countries, we licensed commercial interests, rather than government owned stations.

As a result of this far-sighted approach, we have a world-class broadcast system. The public looks to its local stations for news and information, weather, sports, etc. As long as broadcasters remain in touch with their listeners, they should fare well against newer technologies. Keep in mind, radio has flourished, despite the introduction of television!

We cannot and should not delay the introduction of new technologies and services for the consumer. But we should assess the impact of proposed new services on existing services to determine how best to maximize the benefits of the new service and minimize the negative impact on existing services. Again, localism may be the key for radio stations.

**RW:** Along the lines of that telecommunications bill, is there a point you feel that the voice of a radio station group is too big and too far reaching?

**Ness:** As to the issue of ownership concentration and megamergers, Congress in its omnibus telecommunications act has proposed easing the broadcast ownership rules. I was pleased to see that Congress distinguished between national ownership and competition in the local marketplace. Although national ownership has been expanded significantly in the bill, the drafters have been careful to preserve competition at the local level. I think that the consumers are better served in that way.

I support significantly raising the cap on radio station ownership nationally. It serves no purpose to count 20 small market stations the same as stations in the top 20 markets. At the local level, however, I am more cautious. Pending legislation would increase local ownership opportunities to as many as eight stations, with no more than five in any one service.

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## FCC Certifies EAS Equipment

**WASHINGTON** Two manufacturers were certified to sell equipment for the Emergency Alert System (EAS) at the end of January. Stations have 10 months to purchase their equipment and comply with the Jan. 1, 1997, deadline to switch from the Emergency Broadcast System (EBS) to the new EAS.

Certification for systems from TFT and Sage Alerting Systems was held up in the halls of the Federal Communications Commission (FCC) when the government shut down from lack of money followed by a blizzard. Neither company was able to give prices for their products let alone sell them before certification was complete.

Sources at the FCC expect a few more companies to submit applications for EAS certification.

Some suppliers are cautioning engineers to order their EAS equipment now to prevent long waits from back orders. Because the shelf life of the product will be over so quickly, they warn that TFT and Sage will probably not produce extras.

As far as back orders are concerned, Frank Lucia, acting EAS chief for the FCC, said the commission will see what the situation looks like at the end of the year. He agreed that stations need to order their equipment ahead of the deadline.

Darryl Parker, director of marketing at TFT, said his company realizes that a significant number of stations will wait until late in the year to order and plans to be able to address the market.

TFT is selling the EAS 911R for radio for \$2,250 and the EAS 911T for television for \$2,645. TFT has several products that can be integrated into its basic units.

The first ENDEC was sold to a station in Cincinnati on Jan.

26 — the same day that certification was official, said Gerald LeBow, president of Sage Alerting Systems, makers of the ENDEC.

The ENDEC has six analog inputs and four digital inputs and is available through Harris Allied for around \$2,500. LeBow said that if everyone waits until the last minute to order, there will be supply problems, but he hoped broadcasters will pace their orders.

One of the pluses to purchasing equipment early is, when a significant portion of an area is equipped, the FCC can give written permission for those stations to go to the new EAS tests. Still, stations should retain their existing EBS equipment until Jan. 1, 1998.

TFT commissioned a study on the effects of the EBS weekly test. They found that 44 percent of radio listeners turned off the radio or changed stations when the test started.

The next step is the forming of regional emergency plans. "We certainly would like to see the state plans start to be developed," said Lucia. His office will review state and local plans as they are sent in.

State plans will contain the two EAS monitoring assignments for each station and participating cable systems. Those states that already have effective EBS plans, said Lucia, will not have as much to do.

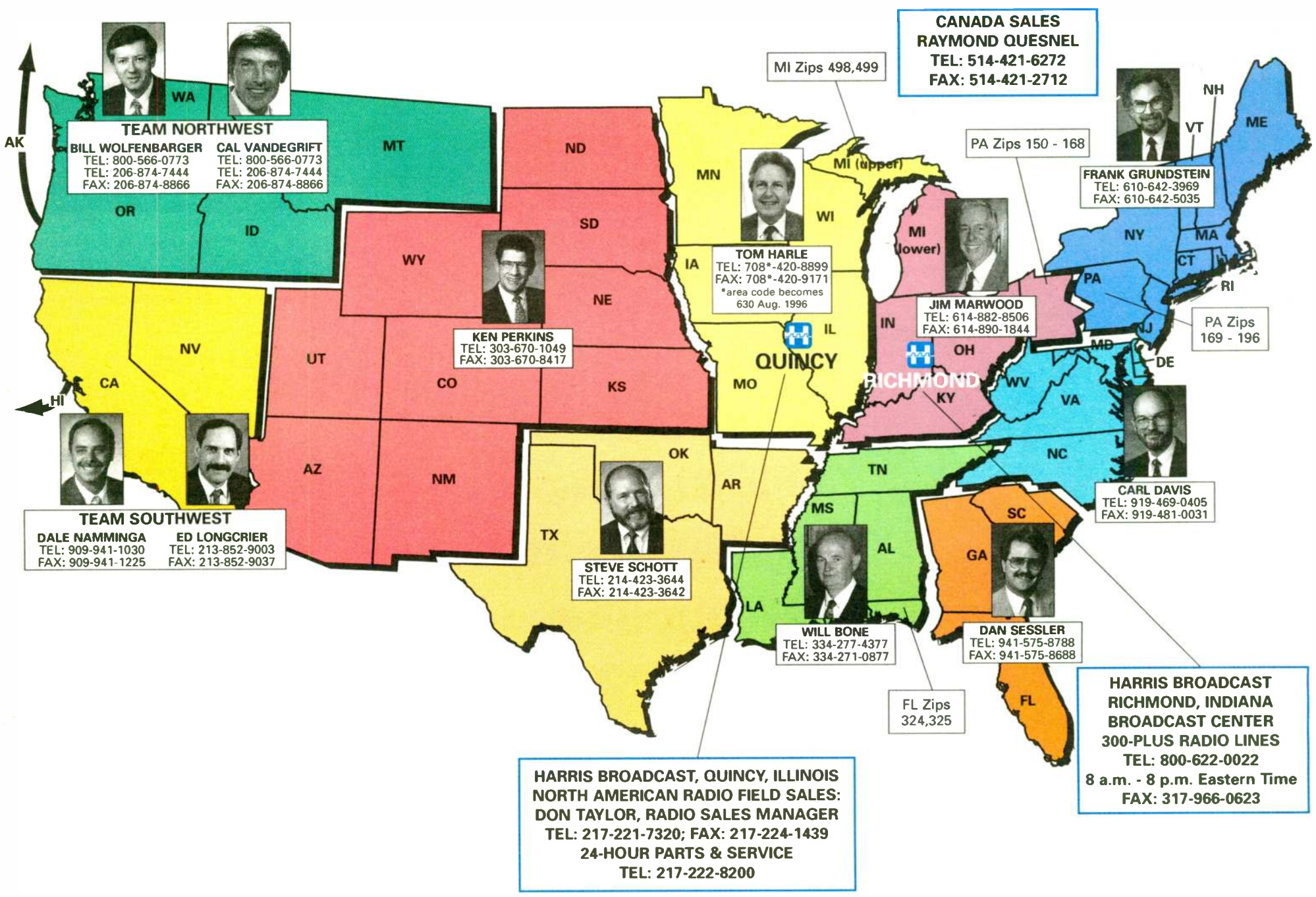
The EAS Office is working with FEMA (Federal Emergency Management Agency) to develop national plans involving more than 30 national primary stations. The 30 stations are mostly clear-channels in major markets, chosen because of their extended coverage, said Lucia.

The national primary stations, which served in a back-up capacity under the old national EBS, will hold a primary position in the new system.

Lucia, Parker, and LeBow are all planning to be at the NAB '96 spring show in April.



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# HARRIS

# FCC Existence Defended

► continued from page 8

Should pending legislation crater, I believe we should initiate a rulemaking to propose increasing radio station ownership limits, provided that we also address the attribution rules. It is unfair to restrict entrance by the front door but leave the back door wide open.

Radio duopolies appear to have had a beneficial impact on the market. Some broadcasters have offered new, more narrowly focused formats that might not have been economically viable had they owned only one FM station in the market.

But somewhere between the present duopoly and unlimited ownership of all stations in a market there is a point at which the public interest tilts from

positive to negative. I want to preserve local ownership and diversity of voices. That is an insurance policy for democracy.

From the standpoint of an operator, it would be extremely difficult to compete with only one station against someone owning five or eight stations in the market. I would expect that most of the owners who have the capital to do so, will feel compelled to double or triple their holdings in the market, further concentrating ownership. There may be many who want to continue to serve their communities as broadcasters but who will no longer find it economically feasible to do so. Is the public interest served by such consolidation?

**RW:** Right now the industry is trying to

find a standard for digital terrestrial broadcasting. It seems throughout the world and Canada, the Eureka system has been chosen. How does it speak to our system here that we are still working on a standard for it while everybody else is moving forward?

**Ness:** We had a similar situation several years ago with advanced television. The Japanese had adopted an analog standard that provided an extraordinary picture, and many were concerned that the U.S. would fall behind.

The U.S. waited a bit, and under a joint effort of many segments of U.S. industry, leapfrogged technology by developing a digital standard that is far superior, more flexible and confers greater benefits to the public than the analog standard. We are far more pleased with this result than we would have been had we arrested

technology by insisting on a standard "now."

Broadcasters are working very hard to come up with a workable in-band, on-channel (IBOC) system for digital radio. That would be ideal because we would not have to allocate additional spectrum for that service, as they must do in Europe and in Canada to accommodate Eureka.

Competing IBOC systems are being tested right now. Assuming that it works, it will provide greater benefits to the American public, as they could continue to receive analog service on their present radios.

I would like to see the development of both terrestrial and satellite digital radio in tandem. I don't think that other countries are as far advanced as we are with a satellite delivered service.

**RW:** Is there any concern at the FCC, in general, that the EIA, who is overseeing the testing, that since some of its main members are founding partners with Eureka and it seems there is a lot of political infighting that is delaying some of the standards process? I know the NAB is in there also and trying to sway things ...

**Ness:** My understanding is that the NAB just adopted a resolution in support of the IBOC approach. We are anxiously awaiting the results of field testing, which is scheduled to begin in late winter. It appears to be moving ahead. There are always fits and starts to any service based on new technology. I intend to encourage terrestrial digital broadcasting, and will try to expedite its approval when it is ready.

**RW:** The Washington rumor mill is always coming up with its own product. One of the things that has been spewing out over the last few years is that Congress is going to do away with the FCC or that they are going to shrink the FCC. The latest thing we are hearing is that Congress is going to review the whole agency and decide whether it needs to be around or not.

**Ness:** If one reads the draft legislation, it is hard to argue that there is an immediate need to eliminate the FCC. The legislation assigns the FCC numerous rulemakings to complete. Congress has given us many new responsibilities.

Those drafting the legislation recognize how useful it is to have an expert agency that can work closely with the states and with industry to keep the pressure on to introduce competition in the marketplace. Full and sustained competition does not happen on day one. We want to achieve full-fledged competition and then whittle away the rules so that the marketplace dictates outcomes.

More and more, as they introduce competition in their domestic markets, other nations look to the FCC as a model for how to allocate spectrum and assign licenses. At WRC-95, several developing nations asked me to talk with them about how we carry out our functions in the United States.

It would be a real pity to send a message around the world that this country no longer believes that an independent agency is necessary to effectuate or referee competition. In my view, now more than ever, an independent agency is needed.

One of the unheralded functions of this agency is to prevent electromagnetic interference. It makes no sense to leave the job of resolving interference claims to the overburdened federal courts. That would be an excessively expensive means of dispute resolution. This agency serves an extraordinarily important role in ensuring that the airwaves are used in the public interest.



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# New Studios on a Shoestring

by D.C. Culbertson

**CHICAGO** WBEZ(FM) can stretch a budget. Three years ago, no one would have believed the transition the station has just made from the mid twentieth century to beyond the year 2000.

The 30,000 watt full-service National Public Radio (NPR) station badly needed new facilities. They were stretched over four floors of a building constructed in the 1920s that had no elevator service to the on-air studios.

# WBEZ 91.5 FM

Employees had to contend with rotary phones, more typewriters than computers, clocks which had to be set manually and only one master control and talk studio.

The station was looking for a central location big enough to house its 50 full-time and 15 part-time employees and to include the latest technology. It also didn't want to have to pay real estate taxes.

## Impossible dream

With no endowment and no assets to speak of, WBEZ was attempting what seemed an impossible task.

But three years ago, Carol Nolan, station president and CEO, following a recommendation by an advisory board member, engaged the firm U.S. Equities to evaluate possible options.

The firm analyzed between 40 and 50 sites before finally settling on Navy Pier in downtown Chicago, a public space which attracts between three and five million visitors per year.

The station decided that in order to live up to its slogan, "Chicago's Public Voice in Chicago's Public Place," it needed to promote itself like any other cultural institution. WBEZ decided on the almost unheard-of solution of building the new facilities so the public could actually see the station in operation but not disturb its normal activities.

U.S. Equities chose David Black, vice president of development – and an enthusiastic supporter of the station – to oversee the WBEZ project.

His responsibilities included negotiating the lease and all major business points as well as hiring contractors and negotiating subcontractors.

First, Black helped negotiate a 99-year lease with Navy Pier's owner, Metropolitan Pier and Exposition Authority (MPEA). Because the site is controlled by the city of Chicago and the state of Illinois and the station is not-for-profit, the lease was possible to arrange.

## Cost cutting

After signing the lease, U.S. Equities developed an initial budget of \$8.6 million and worked with WBEZ to trim it down to \$7 million.

The company worked with a design team led by Nagle Hartry & Associates Ltd. and negotiated with Schal Bovis Inc., the Navy Pier's general contractor, to bid competitively on all subcontracts.

As a result, it saved over \$750,000 which was put toward the purchase of broadcast equipment and related facilities.

Black also made suggestions during design which would create long-term savings like making provisions for member-related activities. Vice President of Engineering Al Antlitz saved additional money by arranging purchases of broadcast equipment directly from vendors.

Antlitz designed the broadcast core's basic layout which he planned as circular. In the center are nine central rooms and three studios with about 25 feet per side. Two studios are talk-interview studios with matching master controls and the

third is a performance studio.

Everything is tied in with a central crosspoint switch which helps save money. There is a special studio and office space for independent production teams. A group from NPR is currently using them. Antlitz plans to add a "cameo" studio with a large bay window for the public to look into.

To keep the studios as quiet as possible, Antlitz used a floating slab to separate the broadcast facilities from the rest of the building. He located the computer mainframe centrally so only keyboards and monitors are in the studios.

Ballasts from neon lights were put outside the core to reduce buzz. All mics are preamplified automatically and set at high levels to maintain uniform quality.

## Custom-designed

Antlitz custom-designed the studio consoles, most of which are analog. The central terminal room where all digital control is done has nine equipment racks, and over 100 percent additional capacity in cable was laid. In the future, WBEZ plans to have a 16-bit digital TT transmitter installed.

Antlitz said that right now, it doesn't make economic sense to go all digital.

The station has budgeted for and is investigating an on-line hard disk system.

Because the bulk of WBEZ's daypart programming is news and talk, most studios are outfitted with phones that contain between six and 12 lines. A Leitch central clock system (accurate to about 1/4 second per year) was installed along with new semi-automated NPR satellite equipment, a four and a half meter satellite dish and an ISDN line for connecting to other stations.

The Illinois Development Finance Authority and LaSalle Bank backed the bonds used to finance the project with a letter of credit. WBEZ is mounting a capital campaign with a goal of \$4.5 million by August to defray those costs. About \$3.7 million has been raised to date.

Although the staff moved into its new home in September 1995, work still remains to be done. Two talk studios, six

**Two studios are talk-interview studios with matching master controls and the third is a performance studio.**

control rooms and the performance studio are ready now and a seventh control room should be ready soon.

WBEZ's experiment seems to have succeeded on all counts. Station membership increased drastically making the station the best-rated in the country for per capita income from listeners. Minnesota Public Radio recently visited the new facilities with an eye to renovating its own along similar lines.

Everyone connected with the project is very proud of their efforts. "It's a tremendous legacy for the city of Chicago and for public radio in general," said Black.

"We went from behind the times to right on the cutting edge," added Antlitz.

## Sportsticker Teams With Info Provider

by Christopher Nicholson

**OMAHA, Neb.** Subscribers to Data Transmission Network Corp. (DTN) can now access more than 1,000 items of sports information daily.

In early January, DTN joined with SportsTicker, ESPN's real-time sports news and information service, to provide instant sports news and information as an optional service to its subscribers.

SportsTicker provides up-to-the-minute scores, breaking news, statistics, previews, recaps and exclusive features from the world of sports. According to Vice President and General Manager Rick Alessandri, the company has over 700 stringers at event sites gathering information and sending it to the SportsTicker newsroom. There, the information is processed and distributed over SportsTicker's five

communication networks.

DTN receives the information from SportsTicker via modem and sends it by satellite to its own subscribers. Subscribers are provided with a satellite dish, color video monitor and a receiver unit in order to receive DTN's information.

SportsTicker is one of approximately 120 optional services available to the almost 100,000 DTN subscribers, said Eric Miller, DTN director of public relations. SportsTicker is the only sports-related optional service offered by DTN.

In addition to DTN, SportsTicker is the primary instant sports source for Reuters, UPI and CNN Headline News, among others. DTN provides information products and services for several other industries including agriculture, automotive, farm implement, finance, mortgage and weather.

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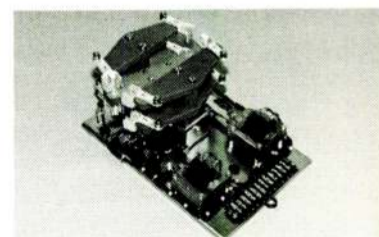
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Circle (136) On Reader Service Card

# Rave Reviews for EV1 Car Radio Antenna

**DETROIT** Station owners who contend with reception glitches in and around valleys will appreciate the early feedback on the new electric car from General Motors. With its unique antenna, the EV1 appears to have excellent reception.



General Motors Electric Vehicle

When the company released 50 EV1s for John Q. Public to test, it received several unsolicited comments on its radio reception in the San Fernando Valley area of California.

People in the valley who could listen only to cassettes in their own cars were picking up stations clearly in the electric cars, said Jeff Jones, Delco's program manager of non-propulsion electronics. Jones has worked closely with General Motors on both the Corvette and the EV1.

The secret is the slot antenna that fits between the head liner and the roof of the car. The roof is made of composite material, which is "the only way a slot antenna will work," said Jones.

Dr. Nagy of GM's research department worked for 10 years to develop the patented antenna, which is also used in the Pontiac Trans Sport. Designers modified it for the smaller roof on the EV1

and capacitively loaded it to make it work. The new antenna is designed to receive vertical, horizontal and circular polarization very well, said Jones.

The new car comes standard with a Delco AM/FM radio, CD and cassette player. Twenty-six batteries are used for propulsion while a single battery powers the accessories. It was not the drag of the radio that designers worried about, but the drag that a mast antenna would have on the car.

Drag is critical, especially when a car travels only 70 to 90 miles between charges. Ten percent of the drag on a car comes from its outside mirrors; a mast antenna can cause a one or two percent drag. Because the back windshield is shaped strangely and the front window is heated on an EV1, inlaying the antenna in a window was not an option.

Noise was another consideration in antenna location. At 60 miles per hour, Jones said the vibration of a mast antenna would be the predominant noise heard in the quiet electric car.

In addition to its excellent reception, the slot antenna is lighter, less prone to vandalism and almost impossible to destroy unless the car is crushed. Despite these benefits, Jones said the cost of composite roofs will prevent it from being used in larger vehicles anytime soon.

The first commercially available EV1s are expected out later this year. The slot antenna is good news for station owners, but with the price of an EV1 expected to be \$35,000, it may be a long haul before all San Fernando Valley commuters start turning off their cassette players.

## DAB Questions Posed

► continued from page 1

compatibility between IBOC digital and its host analog station?

2. The laboratory test results show first adjacent channel interference on in-band DAR systems is 18 to 21 dB worse than FM and second adjacent channel interference is 23 to 43 dB worse.

Similarly, analog-to-digital interference exceeds the FM/FM criteria by 17 to 19 dB for first adjacent channel operations. Please comment as to what impact this has on digital coverage and what impact this has on short-spaced operations?

3. The laboratory results show digital-to-analog first adjacent channel interference is up to 25 dB worse than FM-to-FM and second adjacent channel interference is up to 22 dB worse. Please comment as to the impact this has on analog coverage and the impact this has with short-spaced operations?

4.(a) The USA Digital Radio (USADR) AM system potential unimpaired audio quality assessment averages were in the "very annoying" range compared to the reference CD quality.

What justification exists to consider implementing the AM IBOC system in view of the large margin by which it fails to achieve CD quality and the gap in performance between it and the other systems?

(b) The practical deployment of the Eureka 147 DAR system in other countries uses a 192 kbps data rate, which is shown to produce significantly lower audio quality. Why should the lower data rate be considered?

5. Why should the systems above be considered further if adequate and comprehensive answers are not obtained?

6.(a) Should the USADR FM-2 system be tested and/or considered further given the consistently poor performance it exhibited under RF impaired conditions?

(b) Regardless of the type of multipath used in testing, the same relative ranking of systems shows the following systems to be the poorest performers: AT&T/Amati LSB, USADR FM-1, USADR FM-2 and USADR FM-1 (re-test). Should some of these systems be eliminated from further testing?

7. For systems with a reacquisition time over 3 seconds, please discuss the implications of this for consumer acceptance and the usefulness of further testing. What is the theoretical limit on reacquisition times and, if they were lowered, what effect would this have on system robustness?

8. The lab test data show severe signal-to-noise degradation of "host" station FM subcarriers on 67 kHz and 92 kHz from IBOC systems. Interference from IBOC to other stations' subcarrier operations is also observed. What tradeoff might exist to convince broadcasters to make this sacrifice to implement IBOC DAR?

9. Given that the 1452-1492 MHz spectrum (L-band) is not available in the United States, can Eureka 147 be implemented in the United States? How?

The answers will be discussed at the EIA/CEMA DAR Caucus meeting in March.

## DEF Invests in Svetlana

**HUNTSVILLE, Ala.** Svetlana Electron Devices is riding the tide of tube lovers aided by a three million dollar

infusion of money from the Defense Enterprise Fund (DEF).

The Svetlana that started in St. Petersburg, Russia began manufacturing almost 100 years ago. The company expanded to make light bulbs and then power tubes, winning a prize for high power tubes at the 1933 World's Fair in Paris.

Nearly four years ago, after the fall of the Iron Curtain, R&G International of Alabama became a partner in the newly privatized company and formed a joint venture company, Svetlana Electron Devices, headquartered in the United States.

Now, thanks to U.S. interest in preventing scientists in Russia from selling their expertise to irresponsible nations, the DEF has invested \$3 million in the joint venture.

According to George Badger, president of Svetlana Electron Devices, the invested money will finance the development of new tubes that are already available in the West but not yet produced by the Russians. The new products will serve several markets including television, industrial, medical, hi-fi and musical instrument amplifiers. Badger is especially interested in the latter.

"An early application for transistors was audio amplification, however, a large number of people now believe tubes sound better," said Badger. It is a "very exciting market that is just now exploding."

The DEF is a private venture to finance joint ventures that promote defense conversion in Russia.

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World Radio History

# Web Site Offers DJ Listing, History

by Alan Haber

**KAILUA, Hawaii** Johnny Williams, one of the original Boss Jocks at the mighty KHJ(AM) in the once and forever city of "Boss Angeles," Calif., is keeping the spirit of fifties, sixties and seventies radio alive with a unique site on the Internet's World Wide Web.

440: Satisfaction (<http://440int.com/440satx.html>), a component of parent site 440 International (<http://440int.com/index.html>), is the go when they want to discover the whereabouts of their favorite DJs. Operational since May 1995, 440 has already gone a long way toward preserving an important part of radio's glorious past.

### Ties to radio

Although keeping track of favorite DJs and radio stations is an enormous task, Williams is up to it. The former Boss Jock — Williams spent 10 years at KHJ — has fashioned a site that is as informative as it is fun to visit.

Even the name, 440: Satisfaction, has a tie to radio. Back in the sixties and seventies, remembered Williams, the records at KHJ were kept on racks in the control room; DJs were on one side of the glass and engineers on the other. Jocks would hit the intercom button and ask their engineers for the next song. Each record was numbered; The Rolling Stones' 1965 smash "(I Can't Get No) Satisfaction" was number 440.

"(Satisfaction) had been around there for so long that the number stuck in mind," said Williams. "When I was looking for a name for the site, that just seemed natural."

At first, Williams listed only the stations he had worked for and the people he had worked with on the site.

"Then, one thing led to another and it began to expand from there," he said.



**Then & Now**  
**Left: Johnny Williams in the summer of love.**  
**Bottom: Johnny Williams now finds satisfaction on the Internet.**

About 700 radio stations and 600 personalities are now represented, although, noted Williams, "it's nothing compared to how many exist and have existed."

After he had listed the stations and people he had worked with, Williams noticed that they seemed to intermingle.

"It was interesting how many people had worked for the same radio stations, not necessarily at the same time," he said. "It's amazing to see all the different folks that went through (any) particular radio station — that's turned out to be the case in station after station after station."

### Links

In addition to charting the history of fifties, sixties and seventies radio, 440 serves up a fairly exhaustive array of radio-oriented Web links, including ones to various lists of radio stations with Web sites.

Williams' interest in preserving radio's history isn't limited to 440: Satisfaction. He includes a lot of radio history on the pages of his 440 International site, from

history nuggets, a list of birthdays and a selection of record show prep, all in the helpful name of show prep (Williams makes "Days," which is written by radio fan, former personality and historian Joe Benson, along with Williams and his wife, available to stations by fax, 24 hours in advance of posting on the site, for a fee). "Days" was licensed to cable's Arts and Entertainment Television Networks for use on the Web site it put up for its History Channel.

Williams, who has been out of radio only about a year (he most recently worked at a radio station in Honolulu), also offers a jobs listing for out-of-work or itchin'-to-leave-their-current-station radio people. He has also begun to offer a variety of services on the site, from commercial copywriting to programming assistance. And, with an eye toward turning a profit, he is attempting to sell on-line sponsorships to advertisers.

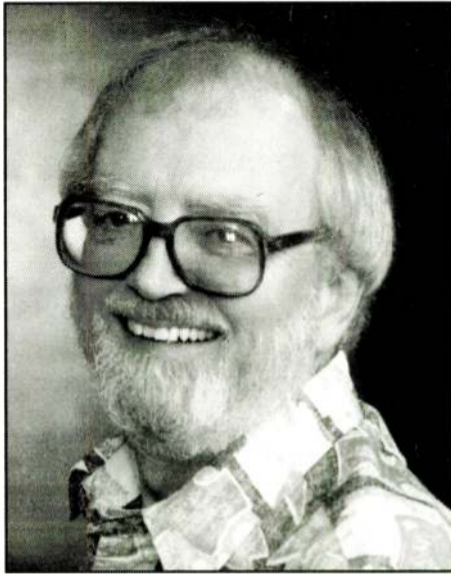
### The right place

The Web seems to be the right place for 440.

"The reach of the World Wide Web is just astounding," said Williams, who runs the enterprise full time. The former Boss Jock has lofty goals for the site — he'd like to be able to list every disc jockey and station, if possible.

For now, though, he is content to simply be making radio fans happy, giving them a chance to find out what their favorite disc jockeys are up to these days.

"That's the kind of effect (440's) having," he said. "That's the only kind of effect I wanted it to have."



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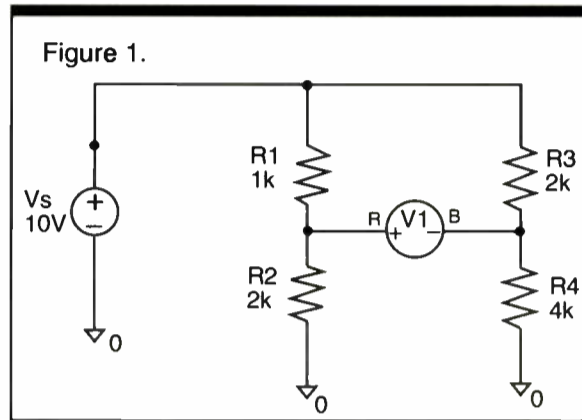
## Analyzing the Wheatstone Bridge

*Invention of English Physicist Is Used To Measure Resistance and With Slight Modification, Reactance*

by **Harold Hallikainen**

**SAN LUIS OBISPO, Calif.** Last month we used Thevenin equivalents to analyze a simple resistive T network. One of the more common applications of Thevenin equivalents is in the analysis of an unbalanced Wheatstone bridge.

editor). The bridge was, and is, used chiefly to measure resistance. Substituting resistances and reactances for the reference resistance in the bridge, and driving the bridge with AC, allows it to be used to measure impedance.



The Wheatstone bridge is named after Sir Charles Wheatstone (1802-1875), an English physicist and inventor.

**General use**

The Wheatstone bridge was first described by Samuel Hunter Christie (1784-1865) in his paper, "Experimental Determination of the Laws of Magneto-electric Induction" (1833). The circuit was brought into general use by Wheatstone in 1843.

Samuel Christie was the son of James Christie, founder of the well-known auction galleries (see "Dictionary of Scientific Biography"; Charles Coulston Gillispie,

Figure 1 shows a simple balanced Wheatstone bridge with a voltmeter as a null detector. Let's determine the voltage indicated by the voltmeter.

The voltage on the left side of the voltmeter (marked R for the red, or positive, lead) with respect to ground can be determined using the voltage divider formula as

$$V_R = (R2/(R1+R2))*10$$

$$V = (2K/3K)*10 V = +6.667 V$$

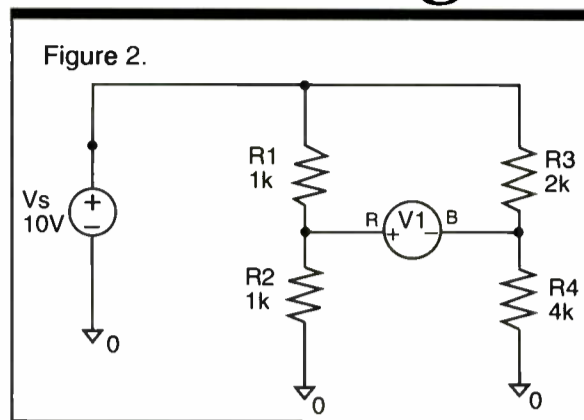
The voltage on the right side of the voltmeter (marked B for the black, negative or reference, lead) with respect to ground can also be determined using the voltage divider formula as

$$V_B = (R4/(R3+R4))*10$$

$$V = (4K/6K)*10$$

$$V = +6.667 V$$

$V_{RB}$  is the voltage at point R with respect to point B.



Further,  $V_{RB} = V_R - V_B$ . So, in this case,  $V_{RB} = 0 V$ . We say the bridge is balanced.

We can see that the bridge is balanced if  $V_R = V_B$ . We can generalize this as

$$V_R = V_B$$

$$(R2/(R1+R2))*V_S = (R4/(R3+R4))*V_S$$

$$R2/(R1+R2) = R4/(R3+R4)$$

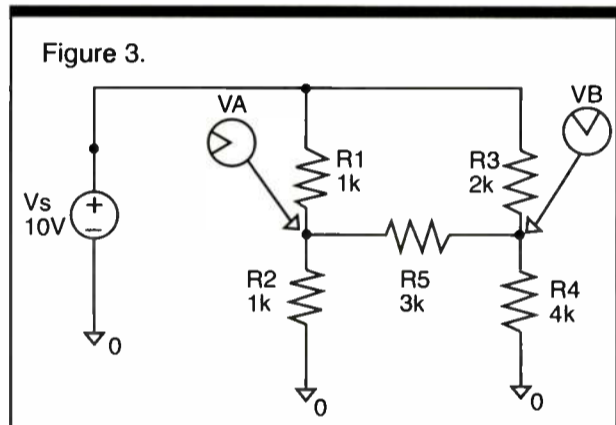
$$R2*(R3+R4) = R4*(R1+R2)$$

$$R2*R3 + R2*R4 = R4*R1 + R4*R2$$

$$R2*R3 = R4*R1$$

$$R2/R1 = R4/R3$$

We now see that the ratio of the resis-



tances in each "arm" of the bridge determines whether the bridge is balanced. Further, if the bridge is balanced, we can substitute an ammeter (ideally, zero resistance) for the voltmeter and read zero current. If we have the same voltage at two points in a circuit and connect them together (through the ammeter), no current will flow.

**Unbalanced**

Consider the circuit of Figure 2. We can see that the bridge is not balanced, based on the resistance ratios (as derived above). What will the voltmeter read?

$$V_R = (1K/(1K+1K))*10 V = +5 V$$

$$V_B = (4K/(2K+4K))*10 V = +6.667 V$$

$$V_{RB} = +5 V - 6.667 V = -1.667 V$$

Note that the voltage is negative. If we were to reverse the voltmeter leads, the voltage would be positive. However, as long as we specify the voltage as  $V_{RB}$ , the voltage is negative, and polarity is important.

Figure 3 shows a loaded unbalanced bridge. We can still use the resistance ratios derived above to determine that the bridge is indeed unbalanced (current will flow through R5), but we cannot determine how much current flows through R5 without using a technique beyond simple voltage dividers.

The "voltage divider formula" works only in a simple series circuit, where all

continued on page 16 ▶

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World Radio History

# Measure Resistance With Wheatstone Bridge

► continued from page 14

the current flowing in one resistor flows in all the resistors. In Figure 3, the current through R1 will equal the current through R2 only if there is no current through R5 (Kirchoff's current law), and we have determined there is current through R5, because the bridge is unbalanced. We will use Thevenin equivalents to determine the current through R5, along with all the other circuit parameters. (We'll "analyze it to death.")

Although it is quite possible (and appears standard) to bring the bridge down to a single Thevenin equivalent, I prefer to make two equivalent circuits, one for the left half of the bridge and one for the right half. This approach allows us to determine all the circuit node voltages from the equivalent circuit while the typical "single equivalent" approach only yields the "load current" (the current through R5).

In Figure 4, we have split  $V_s$  into two equivalent sources. At

this point, we could determine the circuit parameters ( $V_A$  and  $V_B$  would be most useful) using superposition. Give it a try! Apply the voltage sources one at a time, substituting a short for the voltage source that is out of circuit. Determine  $V_A$  and  $V_B$  when each of the sources is present ( $V_A$  due to the left source and

due to the right source), then add the results to yield the total  $V_A$  and total  $V_B$ . It should match what we come up with.

Figure 5 shows the circuit of Figure 4 with Thevenin equivalent

for each "half" of the circuit.  $V_{12}$  is the Thevenin voltage formed by the left 10 V source, R2, and R1. It is the voltage measured at the junction of R1 and R2 (point A) with R5 disconnected. Because this then becomes a simple voltage divider,  $V_{12}$  is  $(R2/(R1+R2))*10$  V, or 5 V.

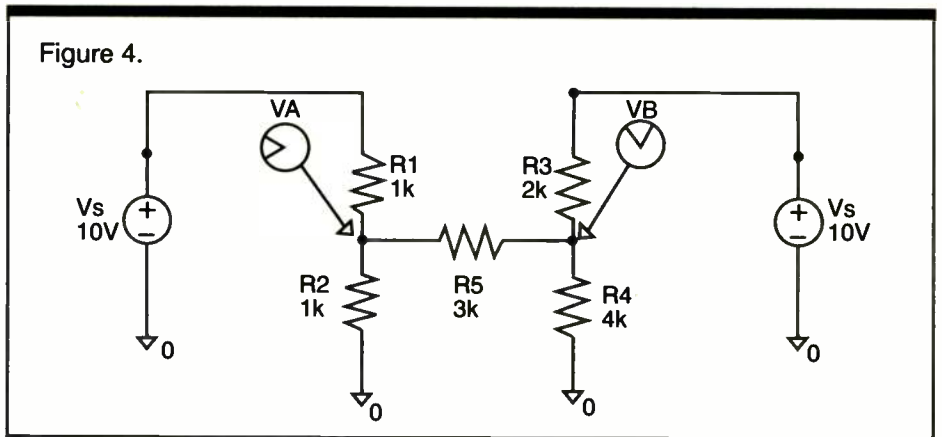
R12 is the Thevenin resistance of the left half of the circuit. This is determined by shorting out all voltage sources and measuring the resistance between point A and ground, with R5 removed. The shorted voltage source results in R1 being in parallel with R2, so the Thevenin resistance is  $1K/1K$  or 500 ohms.

Similarly,  $V_{34}$  is the Thevenin voltage formed by the right 10 V source, R4, and R3. It is the voltage measured at the junction of R3 and R4 (point B) with R5 disconnected. Because this also becomes a simple voltage divider,  $V_{34}$  is  $(R4/(R3+R4))*10$  V, or 6.667 V.

In Figure 5, these Thevenin equivalents are substituted for the original voltage sources and R1, R2, R3 and R4. R5 is carried to the equivalent circuit. The unbalanced loaded bridge has become a simple series circuit that can be analyzed using "differential Ohm's law." The current through the resistors is  $(V_{tail} - V_{tip})/R$ , or  $(6.667 \text{ V} - 5 \text{ V})/4.833K = 344.8 \text{ mA}$ . This current can then be multiplied by the resistance of each resistor to get the voltage across that resistor.

Note the marked voltage polarities and the current direction. I think these are very important! With conventional current, the current flows downhill (from higher voltage to lower), so that is the way the arrow was drawn. If the arrow had been drawn the other way, we would get a negative current going to the right is equivalent to a positive current going to the left. Further, with a positive conventional current, the voltage across a resistor will be positive on the end the current enters and negative on the end the current leaves.

We can verify our calculations by using Kirchoff's Voltage Law (the sum of the voltage rises or drops around any closed loop is zero). If we add the voltage rises, starting at the bottom of the left battery, we find we have  $5 \text{ V} + 172.4 \text{ mV} + 1.035 \text{ V} + 459.8$



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*Make the obvious choice of the future today. When you add up the advantages of MiniDisc by Denon for your station, there are no alternatives.*

•**Recordability.** MD is a universal recording/playback standard, regardless of make or model with the ability to re-record over a million times without signal degradation. No other medium, analog or digital, has this capability.

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•**Performance.** Quality equal to that of CD Compared to analog tape dubs, MiniDisc vastly exceeds all performance specs.

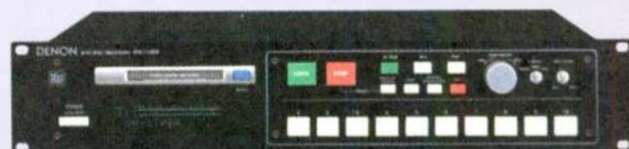
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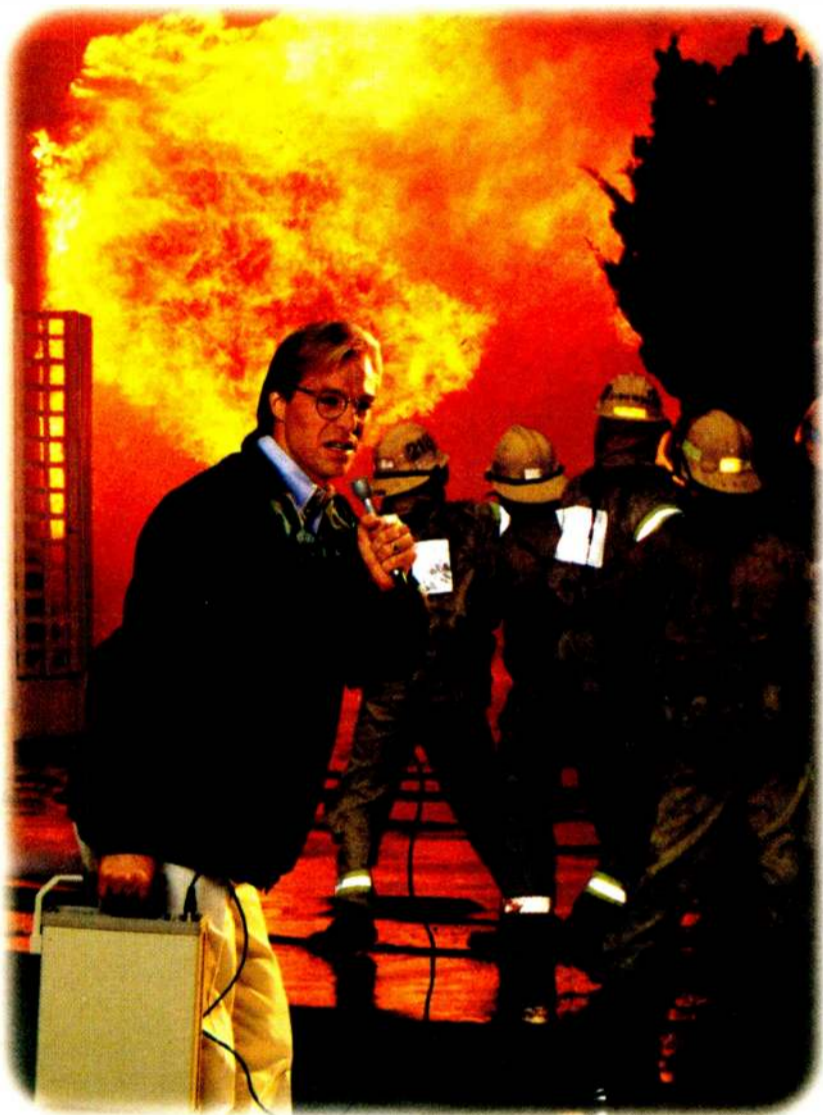
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World Radio History

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Circle (135) On Reader Service Card

World Radio History

# Use Thevenin Equivalent On Wheatstone Bridge

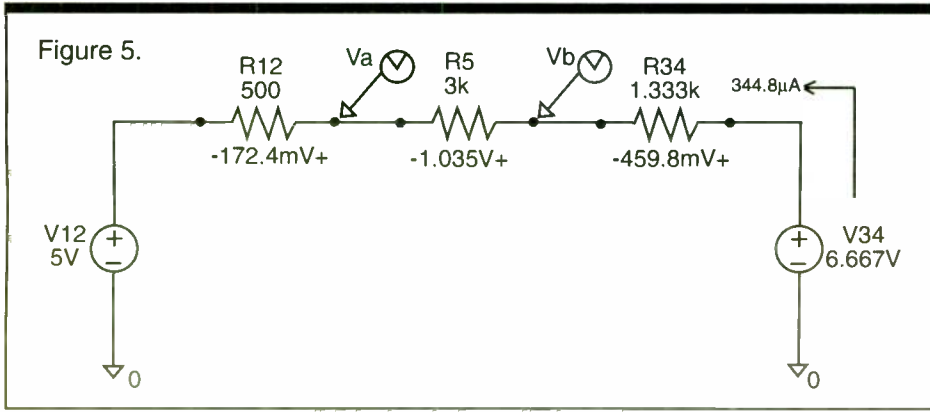


Figure 5.

continued from page 16  
 $mV - 6.667 V = 200mV$ , which is close to zero. The only reason it is not exactly 0 V is due to rounding errors in our calculations. Close enough!

To determine the voltage at any point in the circuit, we can start at a point where we know the voltage (with respect to ground) and wind our way through the circuit accumulating voltage rises and drops. For example, to determine the voltage at point A, we can start at ground on the left side of Figure 5. Ground is 0 V. We "go up" 5 V as we go through V12, because we are "coming out" the positive side of V12 as we work our way towards point A. We go up an additional 172.4 mV as we go through R12, because we are also coming out the positive side of R12. This makes  $V_A = 5.1724 V$ .

We could have determined  $V_A$  starting below the right voltage source. In that case, we start at 0 V below the source, go up 6.667 V going through V34, go down 459.8 mV as we go through R34 (because we are coming out the negative end), then go down an additional 1.035 V as we go through R5. In this case,  $V_A = 6.667 V - 459.8 mV - 1.035 V = 5.1722 V$ . The minor difference is, again, due to rounding.

We have a couple ways of finding  $V_B$ . Let's just say it is 1.035 V above  $V_A$  or 6.207 V. These voltages are substituted back in the original circuit in Figure 6. Once these voltages are known, all node

determined by "differential Ohm's law." By making these calculations, we can "analyze the circuit to death." As practice, try showing that the sum of the currents into the node at the junction of R1, R2 and R5 is zero (Kirchoff's current law). I get  $4.828mA + (-5.172mA) + 345mA = 1mA$ . Pretty close!

Next time we'll look at Norton equivalents, followed by Millman's Theorem. Ten extra points to anyone who sends me biographical information on Norton or Millman.

Harold Hallikainen is president of Hallikainen & Friends, a manufacturer of telemetry and control equipment for the broadcast industry. He also teaches electronics at Cuesta College and is an avid contra dancer. He can be reached at 805-541-0200 (voice), 805-541-0201

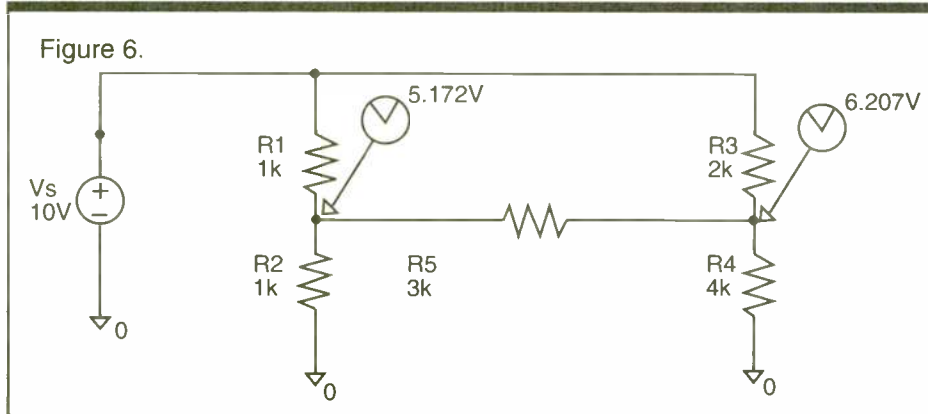
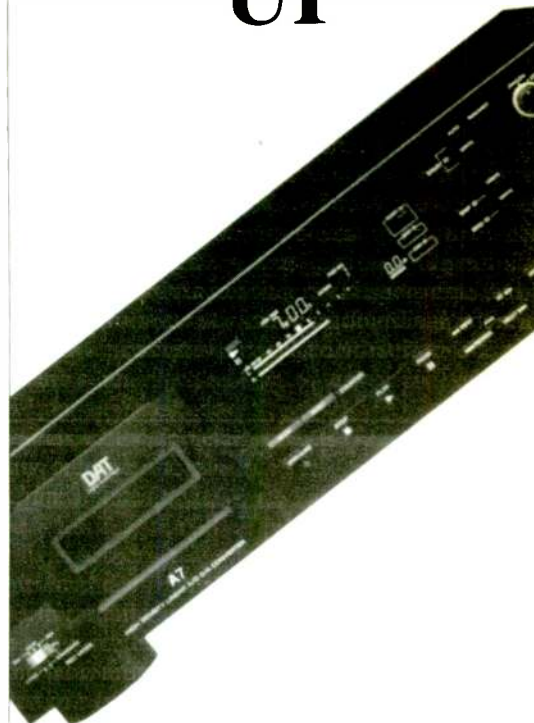


Figure 6.

voltages in the circuit are known. Differential voltages can be easily determined by subtracting ( $V_{AB} = V_A - V_B$ ). Current through any component can be

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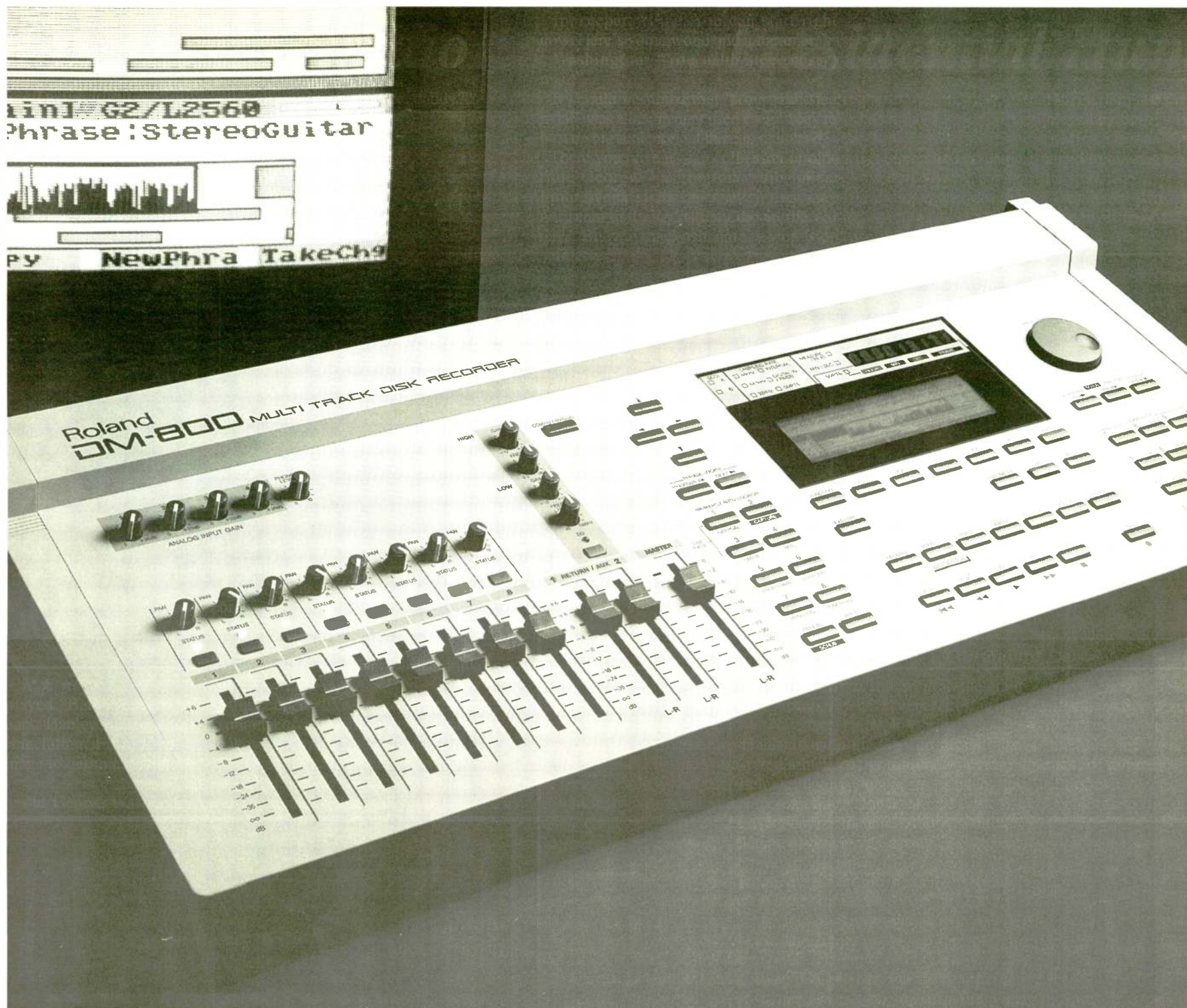
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Circle (170) On Reader Service Card

World Radio History

# Do You Fear Inspection?

by Peter Hunn

**FULTON, N.Y.** For months I awoke with the same nightmare.

My wife suggested therapy, but no local psychiatrist had any experience in curing a station owner of "FCC inspection phobia."

The remedy was to simply stay calm. Never mind that almost every industry publication chronicled lists of stations getting fined. Forget that the guy only one county over had broken the world record for gallons-per-second of sweat pouring onto the transmitter room floor while stuttering "I-I-I d-d-ddon't know" to a pair of inspecting engineers from the nearby FCC field office.

"Simply run those EBS tests," I reasoned, "and make sure the old RCA is not more than five percent above or 10 percent below anything."

Besides, my little daytimer was very basic and clean as a whistle with a fresh coat of red and white paint.

## Fading bad dreams

It took at least a year for those bad dreams to finally fade, or at least rest comfortably under my subconscious (as well as in the public file). My unlucky colleague was almost back to normal too, with a lighter bank account, a wet shirt and only a

trace of that speech impediment.

The days were also peaceful. As gentle as the modulation and antenna current seemed to be getting. Maybe we can get another six months out of those 4-400C transmitter tubes.

My wife nodded, then noticed the presence of a strange car in the driveway. I felt my knees turn to pudding when I noticed the vehicle was tagged with U.S. Government plates.

You have heard about dire situations where your whole life flashes before you? It happened to me right then and there, followed by a vivid vision of the editor of our arch-enemy weekly paper. I could see him grinning from ear to ear as his word processor arrow clicked on Bold

for the headline "Former Area Radio Station Owner Loses Everything and is Disgraced by Federal Agents!"

My thinking was cloudy. Should I kill the plate voltage, grab a screwdriver and look as though things are being repaired? How about hiding out under the big production room Ampex machine after grease-pencilling a moustache on my face for a disguise?

Perhaps threatening to tear open this year's EBS authenticator envelope might buy me a little time.

## Feeling like Jell-O

It was no use. The officially dressed man from the car was in the lobby. My stomach had become Jell-O, as did my once radio-announcer-ish voice. The guy took a small badge-like object out of his suit jacket pocket and asked if I were, in fact, the station manager.

"Y-y-y-yes Sa-sa-sa-Sir," I squeaked, now a total basket case. "This was ... is my station. Wha-wa-what can I do for you?"

"Well," he spoke while offering me a shiny cassette, "I'm from the Environmental Protection Agency and wondered if you would be interested in running our Clean Water public service announcement featuring John Denver?"

"Mister," I recovered, "you give me a minute with that tape and I'll have it on the air before you are out of the parking lot!"

"Take Me Home Country Roads" never sounded so sweet.

□ □ □

*Peter Hunn is an author and professor in the Communication Studies department of the State University of New York at Oswego. He is well known for his "one-man-show" radio stations and recently sold his last station, WZZZ(AM), Fulton, N.Y.*

## Commission Agrees to Portals' Move

**WASHINGTON** While the National Association of Broadcasters was settling back into its old digs, employees at the Federal Communications Commission (FCC) learned that they will be moving too.

But no one knew where the money for the move was going to come from. Planning costs alone, a spokesman said, will require a \$25 million outlay this fiscal year. That is money that the FCC — already facing budget cuts — does not have.

During the furlough, the General Services Administration (GSA) signed a lease for the long-disputed move to the Portals, a series of buildings in the southwest corner of the city. Although a giant "For Rent" sign hangs on one of the buildings facing Interstate 395 in Virginia, construction has not started yet on the dwelling earmarked for the FCC.

The idea to move was hatched in 1989 when the FCC wanted to consolidate its offices that were and still are sprawled among several different buildings along the M Street corridor.

Eagerness for the move has diminished, however. FCC Chairman Reed Hundt has remarked in several public forums that the FCC does not have money to move.

And lack of money is only part of the problem. The FCC currently uses 478,000 square feet of space. The new lease is for 450,000 square feet.

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So if you're torn between a new recorder for the field, or a DAT for the "B" suite, think no more. Pick up a DA-P1. You get the best of both worlds. In fact, once you get your hands on a DA-P1, you may want to buy two. So get to your dealer today and order your new portable DAT from TASCAM.

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# SURPRISE!

## KEYBOARD CONNECTION

# Catching a Cyber-buzz in 'Vegas

by Barry Mishkind

**LAS VEGAS, Nev.** Each fall in Las Vegas, the computer industry convention, Comdex, provides a good vantage point to observe what is new in cyberland. With over 200,000 attendees and over a million and a half square-feet of display space, it is truly a toy store for the big kids.

The buzzwords? Pentium, Windows 95, and Internet Browsers. The key point: if you are planning to purchase computers, the first quarter of 1996 will bring some of the best values ever for buyers.

The reason for this is the continuing plunge in the costs of the main processor

chips. From desktop to laptop, industry sources told us that early 1996 will see a move to make the Pentium series of chips the "standard" for business computers.

This will drop the prices on Pentium chip-based computers to a point where 486 class computers have been in the recent months. This gives the user a distinct advantage in computing power for the buck.

Truly, 1996 will be the year of Windows 95. According to the computer trade press, the sales figures have been strong. Most of the new computers are coming preloaded with the operating system.

This is a major incentive for corporations

that are accelerating their conversion process to take full advantage of Windows 95's features being built into new products and upgrades.

## The Net

It was impossible to miss the huge surge in companies offering products for the Internet. If 1994 was the year the Internet made it into the mass consciousness, 1995 was the year the tools started catching up with the resources and capabilities available on the Internet.

Without a doubt, Netscape is the leading product/company when discussing Internet access. It is easy to install and filled with features.

Netscape dazzled the stock market during 1995. But it was not alone. Microsoft provides Internet Explorer in Windows 95. On display was Internet-In-A-Box Version 2 from Spry/CompuServe, along with Netmanage's Chameleon and Quarterdeck's InternetSuite.

Reacting to the international need to surf in languages other than English, Internet Accent has produced a browser add-on that will properly display over 35 languages.

Actually, everyone seemed to have a suite of Internet tools, some of which we will be reviewing over the next few months.

The hottest area is authoring tools that help develop Web pages without having to know the arcane HTML (HyperText Markup Language) codewords.

Among the Web authors we will report on are Quarterdeck's WebAuthor, Adobe's PageMill and some superb tools from Macromedia, Director and Shockwave, which not only produce Web pages, but multimedia presentations for the sales department as well.

## More and more

Perhaps the most difficult part of developing in-house presentations has been getting decent, affordable color printers. This year, some of the busiest booths were those displaying color ink-jet printers and the hardware and software to drive them.

For example, Epson's Stylus Pro Ink Jet Printer will handle 720 dots-per-inch (dpi) resolution, permitting anyone to develop striking presentation graphics at a modest cost.

And, to make sure you have enough graphics, Epson showed both an affordable, high resolution color scanner and digital camera. Just snap, scan, click and print ... or something like that.

Pizazz Plus from Application Techniques deserves a mention. This program prevents you from worrying about getting stuck with a picture in one application that you cannot get into the graphics format you need.

Pizazz Plus converts file formats, lets you resize or modify the image and quickly and easily print it out.

## Other horizons

Looking at other software areas, the trend toward suites, or bundles of applications, has made it to the mapping and telecommunications areas.

We have talked in the past about mapping programs, like DeLorme's Street Atlas USA and MapExpert, and CD-ROM telephone books like SelectPhone from ProCD.

This year, these and other companies have combined these applications so you can find addresses and phone numbers anywhere in the country and have them mapped out as well.

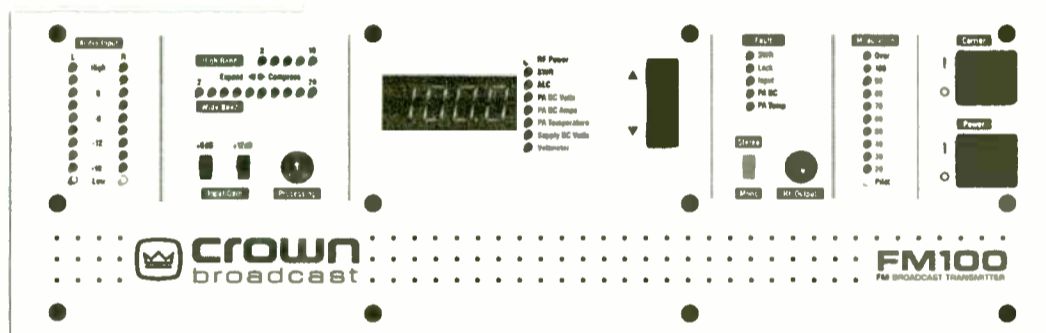
The first efforts show the origins of the respective products, so your choice might be guided by whether the data or the map is more important to you. A fuller review of each bundle's capabilities is in the planning stage.

Similarly, over the past several years, the modem applications have started to bundle FAX options, and vice versa. Delrina's CommSuite 95 has taken this trend to its logical conclusion.

Inside the box is a modem program, WinFax Pro, Cyberjack for Internet access, and TalkWorks, a program to turn your computer into a voice-mail system.

continued on page 50 ►

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# Please Don't Call It A Fish Finder!



Pictured above is Dennis Greben, manufacturing manager at Radio Systems. As you can probably guess from the snapshot: when he's not supervising the production of consoles, clocks, DAs, and digital systems, he's out on his boat. (He's pictured here with his "Penn Yan Sport Fisherman" which he personally completely refurbished over a period of 30 months.)

But, to get to the point: two years ago, when Dennis saw the first prototype of the trademark Cart Emulator Interface for the DDS Digital Delivery System, he unceremoniously announced "Hey, that looks kinda like one of the **Fish Finder** sonar units I want for my new boat!"

The name stuck. Despite all of our marketing efforts and rave product reviews from major markets, people still call it a "Fish Finder."

The truth is: the Cart Emulator is actually a custom, sophisticated, exclusive broadcast control surface for the Radio Systems DDS Digital Storage System which is the only digital audio system built on a UNIX-style, real-time, multi-user operating system, it's the only platform that can simultaneously support dozens of our custom cart emulators for live operation, touch screen and windows CRT applications for live assist, and automation and traffic applications.

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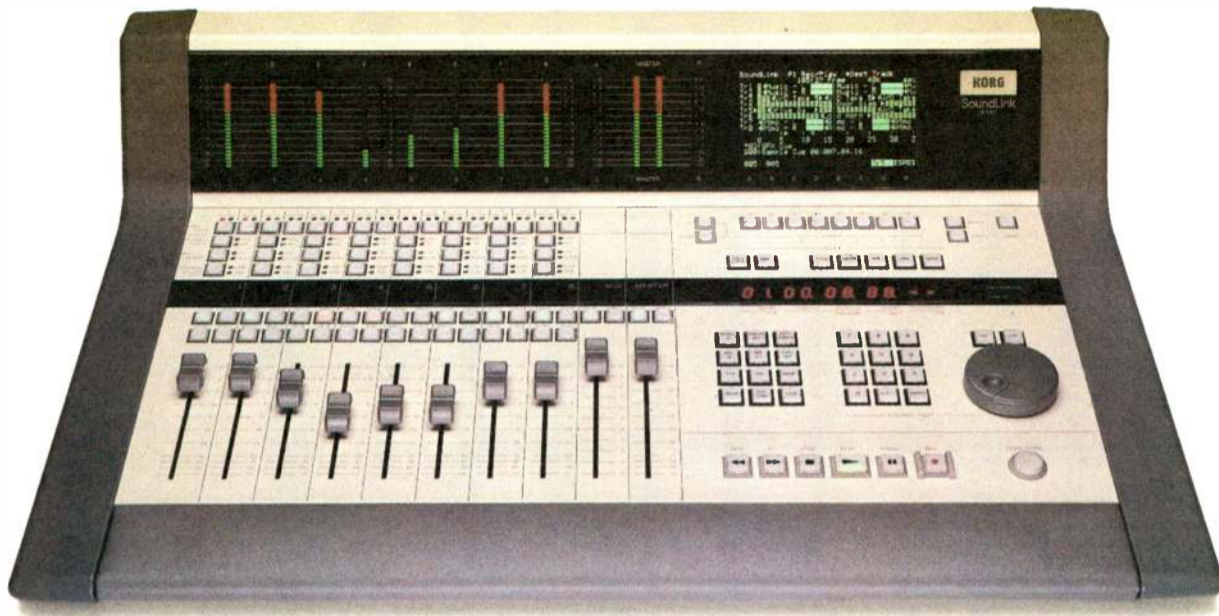
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— Rick Wiggins, Creative Director  
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*"It's one of the few pieces of equipment at the station I don't have to worry about."*

— Fred Holub, Chief Engineer  
KLAX-FM/KXED-AM, LA  
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*"This is the 90s production room solution. Its integrated digital console, storage and editing combine to make one of the most efficient and cleanest operating studios you can find anywhere."*

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Circle (84) On Reader Service Card

World Radio History



# Studio Sessions

The Denon  
DN-1100R  
Holy Hot Keys!  
See page 27.

Equipment and Applications for Radio Production and Recording

## ART's Tube Preamp Has a Big Sound

by John Diamantis

**FREDERICKSBURG, Va.** Since our last space-charged episode, I have experienced a minor realignment in my feelings toward trick circuits and tube/transistor hybrid-based products.

Any circuit that intentionally defiles the audio waveform to mimic the qualities of vacuum tubes is not something I would personally use. You and I, dear reader, know that a competently-designed tube circuit will rival and perhaps outperform a similarly-functioned solid state circuit. Such a tube circuit will not cause audible distortion within its useful range.

If I were amplifying a guitar, I might play a different tune and put that distortion to good use to get some good-sounding, crunchy sustain.

Which brings me to the second part of my micro-epiphany. If a circuit or product is hybrid in configuration, performs its function well and brings the marvels of tube technology to the masses at reasonable prices, then I will call it good; maybe even elegant.

Further, should this wonderful device happen to use a low voltage wall wart transformer, I promise not to giggle.

### The revelation

This minor alteration of my filamentary psyche came about with the auditioning and testing of a couple of new products at the Tube Talk Laboratories. The pick of the litter was a box from Applied Research and Technology (ART), called the Tube MP Personal Preamp Processor/Professional Tube Mic Preamp.

While this may seem like a lot of name for a little box (5 by 5.5 by 2 inches), it is a lot of box for only a little money.

At around \$149 list and \$129 on sale, the ART Tube MP is the least expensive device I have auditioned for Tube Talk. Yet, its packaging and sound quality rival boxes at four or five times the price.

### One stuffed box

The circuit is a real hybrid. It utilizes a discrete transistor differential balanced input with a couple of ICs for buffering and the balanced output stage.

Right in the middle of all the fun is one 12AX7 twin triode for some nice tube-type gain.

As I did not have a schematic handy, I had to rely on Mr. Cordless Screwdriver and sketchy details from the small user's guide pamphlet to try and figure out what was going on inside.

For 150 bucks, you were expecting a hardbound service manual, maybe?

The tube circuit behaves like a two-stage affair. The first stage supplies gain and the second stage acts as a follower.

The tube circuit comes after the input gain control and before the output control. This lets you adjust how much signal is hitting the tube grid independent of your output drive requirements. More on that later.

The ART Tube MP has connections for XLR balanced ins and outs, quarter-inch instrument ins and outs, an absolute phase-reversal switch, a clipping LED and a 20 dB gain switch. The switch yields a total of up to 70 dB of gain with the knobs wide open.

Everything is wrapped up neat and pretty with nice graphics in an unusually-shaped steel box. And it is designed and built here in the good old USA.

The ART Tube MP uses a 9 VAC wall wart, yet the tube and phantom power need to see around 42 V to operate. How do they do this? A voltage multiplier circuit inside steps the 9 V up to 42 V. Neat trick.

### Those low voltage blues

Hold on there. How will a 12AX7 work with a B+ of only 40 volts? Obviously not fully in its linear region. But if the gain stages are set up correctly, something very interesting occurs ... something not even mentioned in the MP's user guide.

In its normal range, the circuit is designed to operate with low distortion. As input drive is increased, the tube begins to enter its non-linear region; the result of which is an increase in distortion. Not serious distortion, but enough to raise the suspicious eyebrow.

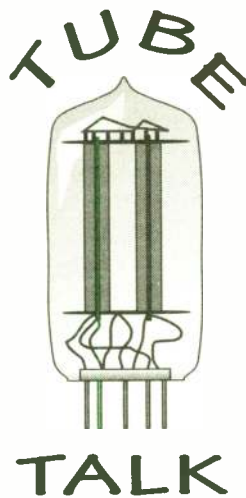
As the clipping point of the circuit is reached, the tube enters saturation, resulting in soft clipping of the audio waveform. Next stop, Square Wave City.

This transition begins about 20 dB below clipping where THD is about 0.2 percent, to a point just before the onset of visible clipping of the waveform viewed on a scope. That places THD at about 2 percent.

"Blasphemy" you scream? Lies and trickery? Trickery maybe, but no lies here.

I listened to the ART Tube MP for a long time, did my measurements and evaluated it again on its own. Then came A/B comparisons to some other respected mic preamps.

Know what? This circuit works. It is not perfect, but it is close.



ART  
MP Tube  
Mic  
Preamp

In live studio situations where you want to maximize signal-to-noise ratio, there is always a problem with occasional overloads, increased gain settings and loud mouths. With a purely solid state preamp, the sound goes from clean to smashed once you have passed that clipping threshold. We are talking big-time buzz here.

A well-designed vacuum tube mic preamp will also go into clipping but in a slower, more controlled manner, leaving an extra couple of dB breathing room.

The waveform only begins to softclip at saturation, not through the entire input range. This "transfer function" is what the ART Tube MP emulates.

I can hear the naysayers now. "If you set your levels properly to begin with, your preamps would never go into overload

and you must really like distortion because tubes distort blah blah blah ..."

I say anyone who thinks this way has either never worked inside a radio station with live, breathing announcers, or puts up with all that hiss while constantly lowering input controls. The fact is, all amps clip. Some clip more than others, some clip more gracefully.

The next time you have nothing to do (yeah, right), hook an oscilloscope up to the program output of your audio console. Watch carefully through music or talk segments. I will bet you see at least one little sawed-off waveform.

### Practical test

With a Neumann U-87 plugged in, the ART Tube MP sounded warm and clean with no apparent hiss and what felt like a good amount of headroom. Increasing the input control to intentionally overload the circuit roughed up the sound a little, but did not really sound bad until the input knob was at full-tilt clockwise. By then, there was obvious waveform distortion taking place.

A Sennhieser 441 dynamic mic was pressed into service and sounded crisp, with a nice full low end.

While lacking the finesse of its more expensive brethren, the ART Tube MP vindicated itself handily against all comers. Its sound was full, strong and clear, and when operated in its linear region, sounded just like a fine mic preamp.

### On the bench

The ART Tube MP met or exceeded published specs. THD was typically

continued on page 28 ▶

### SHORT TAKE

## Yamaha Targets the Pro Market with New Reverb

by Alan R. Peterson

**BUENA PARK, Calif.** Yamaha recently introduced the ProR3, a powerful new studio reverb with a panel design reminiscent of their earlier REV-5 and REV-7 models.

The ProR3 is being targeted to the professional studio market. It incorporates a new Yamaha DSP chip, has 32-bit processing power with high-performance 20-bit A/D and D/A converters. Dynamic range is claimed to be 110 dB.

Yamaha designed the ProR3 to provide high-resolution reverberation with a smooth, noise-free decay. True stereo processing, parametric EQ and gating are included to enhance the unit's reverb programs. Room-tone

simulation programs and echo effects are also offered.

The ProR3 has 99 preset memory programs and another 99 user memory locations, and features balanced and unbalanced

XLR and quarter-inch connectors. MIDI In, Out and Thru jacks

are included for direct program selection via MIDI, as well as program dump capabilities.

Yamaha made news last year with the introduction of the low-priced REV100 digital processor. The ProR3, which will be delivered during the first quarter of 1996, places Yamaha at both ends of the price spectrum for signal processing.

For more information, contact Yamaha at 714-522-9011.



Yamaha ProR3 Reverb



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

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.



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PRODUCT EVALUATION

# Hot Keys Heat Up Denon MiniDisc

by Chris O'Brien

**MANASSAS, Va.** Although the critiques of MiniDisc technology are many, there seems to be quite an abundance of players and recorders on the market.

Previously in RW, I reviewed the Sony MDS-B3 MiniDisc recorder and am currently using two MDS-B3s at WRCY-FM, so I am well aware of the capabilities.

For readers who still do not believe audio quality of the MiniDisc is acceptable, let me reassure you: I have stumped even seasoned audiophiles with the quality of the MiniDisc.

Over the air it is very difficult to differentiate between music played from MiniDisc, hard disk or CD. Try this "blind taste test" with your engineer. The results are always amusing.

Now to step down from my MiniDisc soapbox and deal with the subject at hand. The Denon DN-1100R MiniDisc recorder/player.

**Professional design**

Denon's name should be the first clue that the product is well-designed. I am certainly a big fan and consumer of its products.

The original intent of the DN-1100R was for audio playback in theaters and in public areas such as malls, lobbies and train stations. It has applications as a sample record/playback device for dance DJs and for firing sound effects in live broadcast and post production. WRCY uses MiniDiscs for more, and you will soon see here why you may want to.

The DN-1100R is a rugged rackmount unit that has been designed with the professional producer in mind. This is a fine piece of equipment and improves upon many already excellent features of its predecessors.

Among the bells and whistles: an

auto-loading slot for MiniDisc cartridges, a rotary shuttle knob and the instantaneous hot-start Play keys. Of the three, the instantaneous play is the most valuable in the studio environment.

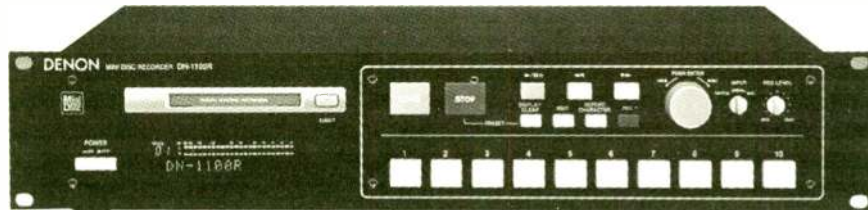
For example, at WRCY we utilize MiniDisc recorders to capture traffic, weather and news reports via a balanced line from Metro networks. With our current MiniDisc players we must cue up each track individually prior to playback.

The DN-1100R features 10 hot keys that can be loaded with audio for instan-

that editing can sometimes be tedious. Many MD machines, including the Sony MDS-B3 and the comparable Denon model, will give you the message SORRY when attempting to combine tracks, meaning your edit is not possible.

I do not need to tell you that this is extremely frustrating. The good news is, I was not able to create a such scenario in which the DN-1100R could not perform the desired editing job.

Installation of the DN-1100R is simple, with both RCA jacks and XLR ins and outs



Denon DN-1100R Recorder/Player

taneous playback. This is especially useful in a busy morning or afternoon drive show where the fur is always flying. Hotkeys really come in handy in the heat of battle.

**Editing features**

There are basically six edit features on the DN-1100R. They are Track-erase (erasing individual tracks), All-erase (clearing all tracks), Divide (dividing tracks), Combine (combining tracks) and Title (labeling tracks).

Titling a cut may seem daunting at first. The inclination is to look for an alpha keypad. The DN-1100R's rotary control is used to dial-in and select characters. A title can be 255 characters long, but the combined total number of characters per MiniDisc cannot exceed 1,700.

Experienced MiniDisc editors can tell you one downside of MD player/recorders is

to choose from. The back panel also accommodates digital data on an RCA jack.

A 25-pin port for an optional external Hot Start remote box is also on the rear panel. This box duplicates the 10 hot keys on the front of the DN-1100R, so the jock need not be near the recorder to trigger an event.

I just happened to have a spare space in my equipment rack and once the DN-1100R was mounted, it was off to the races!

**Multilingual manual**

As usual, I did not read the manual prior to my first attempt at making the DN-1100R work. Really, does anyone?

After all, user-friendly equipment is the most desirable in a radio station. I found the DN-1100R extremely easy to use and discovering its functions was quite simple.

Product Capsule: **Denon DN-1100R MiniDisc**



**Thumbs Up**

- ✓ rugged design
- ✓ hot keys
- ✓ editing capabilities



**Thumbs Down**

- ✓ data screen hard to see

For more information, contact Denon at 201-575-7810; or circle **Reader Service 14**.

I did eventually crack the manual, which is translated into five languages. It was refreshing to find the English portion written in plain, easy-to-follow language. No engineer was required to translate this manual.

The DN-1100R is not very high-tech in appearance and could use a larger data screen, but like your mother always said, never judge a book by its cover. The recording capabilities are pretty much industry-standard, with a maximum record time of 74 minutes. The sampling frequency is 44.1 kHz, about the same as most quality .WAV editors for Windows.

The recording system is a magneto-optical overwriting system (magnetic field modulation) and the playback system is an optical semiconductor laser non-contact pickup system. Signal compression is handled by ATRAC (adaptive transform acoustic coding), but as already stated, this is standard stuff for MiniDisc recorder/players on the market.

The DN-1100R by Denon is a superb addition to the production studio or on-air studio, especially if your station utilizes a great deal of outside studio input, i.e., callers, news, weather, traffic and sports.

□ □ □

*Chris O'Brien is the program and operations director of WRCY-FM, "Thunder 107.7 FM," Washington, D.C. E-mail him at chobrien@aol.com or thndr1077@aol.com*

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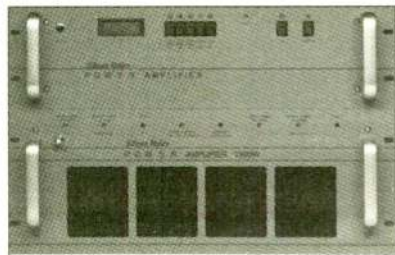
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# Homer's Incredible Vanishing Dog

by Alan R. Peterson

**WASHINGTON** One of the best things about living in the nation's capital is the abundance of fine arts and how close it all is to home.

I hop the Metro subway system only a mile from my apartment and in minutes I am on the National Mall in front of the museums of the Smithsonian Institution.

Last month at the National Gallery of Art, I was privy to a free radio production lesson, given by no less than the great American artist Winslow Homer and his vanishing dog.

I know that sounds unlikely. After all, Homer was known more for his paintings than his radio production. Complicating things further, he died a decade before radio's "first birthday." And what exactly does a vanishing dog have to do with this?

This may take a few moments, but follow along.

## The man, the paint

A little biographical information is in order. Most production folks think of Homer only as the cartoon character that

yells "Doh!" on TV.

Actually, Winslow Homer was born in Boston, Mass. in 1836 and died in 1910. He lived in England, Maine and in the Adirondack Mountains of upstate New York. Owing to a severe absence of radios during his lifetime, he instead

became a painter. A very famous one.

One painting in the exhibit caught my eye for a peculiarity it included.

## Anyone seen the dog?

A young boy is shown in a country setting. To the viewer's right, a phantom dog is materializing as if returning to haunt the boy. "Old Yeller's Revenge," I heard one viewer quip.

Actually, Homer did paint a dog, but then removed it by painting over it to alter the composition of the picture. Over the years, that layer of paint thinned out, revealing a ghostly hound dog that seemed caught in a transporter beam.

Buoyed by this discovery, I began looking for similar paint-outs on other pictures. A boy on a boat was replaced by an anchor in one picture. A boathouse was completely eliminated in another. The head of a deer was redone for a hunting

scene. Three masts on a grounded schooner were painted over by sky. Paint-outs were visible in many pictures.

So what is the lesson to be learned from the parallel between Homer's paintings and radio production?

Easy. When you least expect it, you too could be fired and replaced by a boat anchor.

## No, really

All right, all right. The fact is, Homer changed a number of pictures as a reaction to public response and critique.

If a critic or a buyer commented on not liking the painting for one reason or another, Homer did not snort and sniff into the air, nor did he storm around his

## Radio production can still show off the genius of the person who produced it.

artist's studio, throwing brushes (much less carts). I am reasonably certain he also refrained from cursing out the stupidity of the client.

Does this sound like somebody you know working at your station now? What kinds of reactions occur when a jock is told to recut a spot because the client said so?

Temper tantrums? Sabotage? Refusal to do the project? How about refusal to even come to work? I knew someone like that at my last gig.

So what did Homer do? He made the changes.

That is the free lesson I gleaned from Winslow Homer. With little or no complaint, Homer "painted out his dogs" based on the reaction viewers gave him.

Certainly, he would have been happy with only his own opinions on his work. But instead he listened and made the

changes. The end result landed his work in one of the world's most famous galleries.

Admittedly, as a radio production director, I never liked being told my work was unsatisfactory. When I would commit several hours of my life to a project — hours that will never be recovered — and then be told that project came out crummy, my normal, natural reaction was to want to blow up the world.

How dare these clients tell me my work is no good? Do I tell them their shoe stores are lousy? Their nightclubs are too lame for words? Their car dealerships are huge ripoffs?

Not to their faces, anyway. I would mutter a few raw words to myself and my writer, refill my coffee mug, then take two minutes away from the studio to compose myself. If I were really steamed, I would make a "Christmas reel" spot about a particular client; you already know what those are.

But like Homer, I knew the only thing to do was paint out my dogs and get on with the work.

I told you earlier that the paint covering Homer's dog had faded, partially returning Fido to this world. How ironic Homer's genius still shone through after the decision was made to eliminate the hound.

## Genius

In much the same way, radio production can still show off the genius of the person who produced it. Just because the client wants the laser blast removed from a dance club spot and replaced with a different effect, does that make the overall product inferior to what it could have been?

I say no. Paint out your dogs, then find another, more creative way to give the project your sonic signature. Make it one that tells the client that only your station has the skill to produce it while sending a message to other production people in town you are not to be trifled with.

When Homer went back and fixed his paintings, the public and the critics were happy. Eventually, his work ended up in the Smithsonian.

May we all be so lucky when client critiques force us to paint out our dogs.

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## Tube Preamplifier is a Real Work of ART

► continued from page 25

around 0.1 percent for frequencies between 20 Hz and 10 kHz. This increases to 0.2 percent at 20 dB below clipping, 0.6 percent 10 dB below, and around 2.0 percent 0.5 dB below visible clipping on the scope.

Output level at this point was +26 dBu. Max out was +28 dBu, and let me tell you, it was ugly. Frequency response was 20 Hz - 20 kHz.

Typical SMPTE IMD measurements (not spec'd) were: 0.5 percent at 20 dB below clipping, 2 percent at 10 dB below clipping and 4.5 percent 1 dB below clipping.

While this seems on the high side, remember that your typical waveform will be operating in that 0.5-percent range most of the time.

The increase in IMD will muddy the sound a little bit on peaks and, to a small degree, this was noticeable in

my auditioning, but as the man says, "Whaddaya want for 150 bucks?" Hybrid or tube preamps with lower measured IMD that sound cleaner when approaching clipping means shelling out a lot of extra cash.

While I could not replicate the noise figures shown for this unit (-129 dBu, "A" weighted, EIN), I measured -82 dBu below +4 dBu, real world 20 Hz - 20 kHz bandwidth, set for 30 dB of gain. The ART Tube MP is quiet.

I really liked this little box. The ART Tube MP is well made, well thought-out and sounds great, especially when you consider the price.

Plus, it changed the way I view the world to a small degree, which is always a good thing.

□ □ □

*John Diamantis is chief engineer for WBQB-FM, Fredericksburg, Va. He can be reached at 540-373-7721.*

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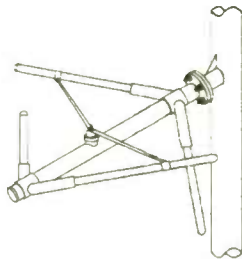
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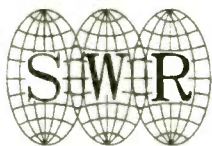


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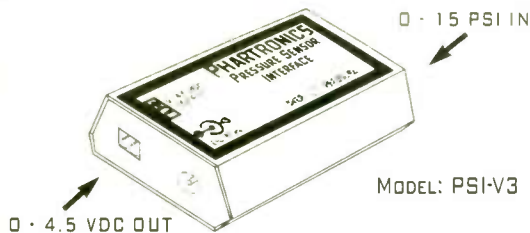
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## DIGITAL DOMAIN

# Consoles and Digital Gymnastics

*Design Problems Are Not Always Solved by Opening the Stewpot and Adding Another Microprocessor to the Recipe*

by Mel Lambert

**LOS ANGELES** I sometimes wonder if the radio community, in the rush to embrace digital technology, is overlooking some obvious facts of life.

During a recent panning session with a well-known hardware manufacturer, the topic of discussion turned inevitably to

new product designs.

Why, posed one member of the group, don't we use our core signal-processing technology to develop an all-digital control console for the radio industry?

## Burst of brilliance

Great idea, we responded. This was one of the newer guys within the department and we felt it necessary to hear him out before getting to the nub of the matter.

Sure, he enthused, we could mimic in silicon the functions of, say, a 12-by-4 console. We could provide separate stereo program and audition busses and all the monitoring, metering and cue functions we might expect from such a format.

EQ? Sure we can add EQ. Simply dial in another Motorola 56000, and implement a natty algorithm. Same for dynamics control. We could all see that this guy had done his homework.

Once we had established that the expected end-user cost for this puppy was to be close to \$35,000, we moved on to the next topic: How do we dramatically increase booth traffic at the NAB Convention!

Even if the projected price for this proposed product could have been closer

to \$5,000, I could not help but wonder if this really was the best way to utilize digital gymnastics.

## Golden ears

Last time I checked, audiences were not tuning out in mass numbers because they could hear the difference between an old Sparta rotary analog board with little signal processing and an all-digital control surface.

**I see nothing wrong with using analog circuits for even complex functions.**

Sure, I would be the first to concede that CDs have dramatically enhanced the sound of music being replayed over America's airwaves. The new generation of hard-disk replay systems are likewise dramatically reducing the phasing and distortion anomalies we have come to expect from the majority of cartridge-based formats.

In other words, just because we can design a box that can replicate familiar analog functions in the digital domain, is that truly the best long-term approach?

As I have discussed before in these illustrious pages, to fully take advantage of the sonic and operational advantages offered by digital technologies, we really

need to take an integrated — even holistic — design approach.

In the case of the suggested on-air mixer: During a subsequent meeting it was proposed that a task force be assigned the chore of gathering intelligence from the radio industry.

Criteria would not consist solely of what control functions an air board might be expected to perform, but how it might be fully integrated with communications and related functions. This way, the anticipated design could be set up to encompass a wider range of possible applications.

Not only that, such a console can be configured in ways that would allow it to be expanded or contracted to suit the more precise needs of a radio station.

And, while this task force was going to be busy about it, perhaps a close look at the various ways in which storage technologies might or might not be integrated within the design concept.

## Pop the hood

At one time, adding more functions in an analog system normally required a soldering iron, additional circuit boards, connecting wire and a detailed schematic. The same cannot be said for digital-based systems.

Here we are more involved with reconfiguring various blocks of digital signal processing (DSP) and implementing a new set of software commands, or perhaps even setting up additional data highways to carry digital information from external storage devices to the core data-crunching blocks.

If sufficient processing capabilities have not been built into the core system, adding or expanding certain functionality may be either very difficult or prohibitively expensive.

All of which might be evading my main point, which is expressed quite simply: Just because we can design a given system in digital circuitry, is that necessarily the best way to go?

I see nothing wrong with using analog circuits for even complex functions. In fact, in many instances it will outshine the performance of a competent 16-bit digital equivalent.

The arena where digital dramatically outscores analog, however, lies in critical areas of assignability. This includes reconfiguring the control surface of the console.

Trying to redo the layout of a conventional analog board is virtually impossible without a bank of rotary switches per input and output, to say nothing of peripheral functions. Then there is storage and recall of complete system settings.

If there is some advantage to be gained from modeling a current analog design in silicon, in terms of extending the user functionality and adding other creative possibilities, then there is every reason to pursue that design avenue.

If, however, it adds nothing to the final product — aside from a higher sticker price — then manufacturers might better spend their time on other pursuits.

What about a transparent, non-intrusive digital audio data compression algorithm? Well, now we're talking!

□ □ □

Mel Lambert is principal of Media&Marketing, a West Coast-based consulting service for the professional audio industry. He can be reached via [mediapr@earthlink.net](mailto:mediapr@earthlink.net) or at 818-753-9510.

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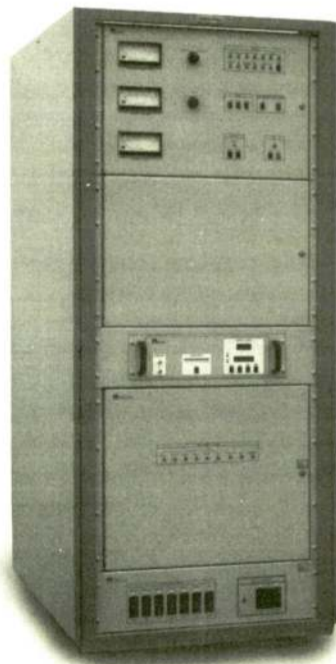
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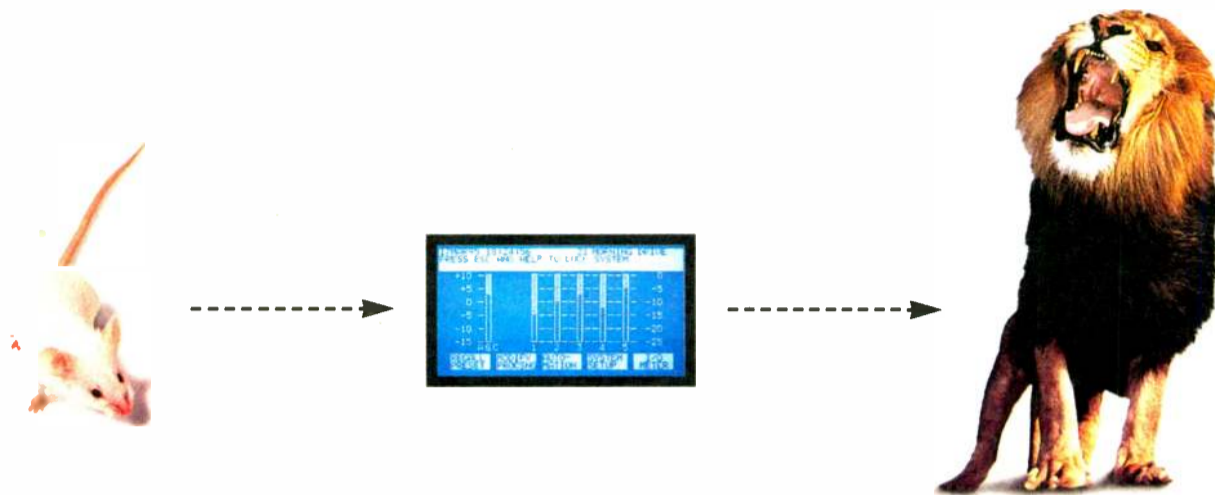


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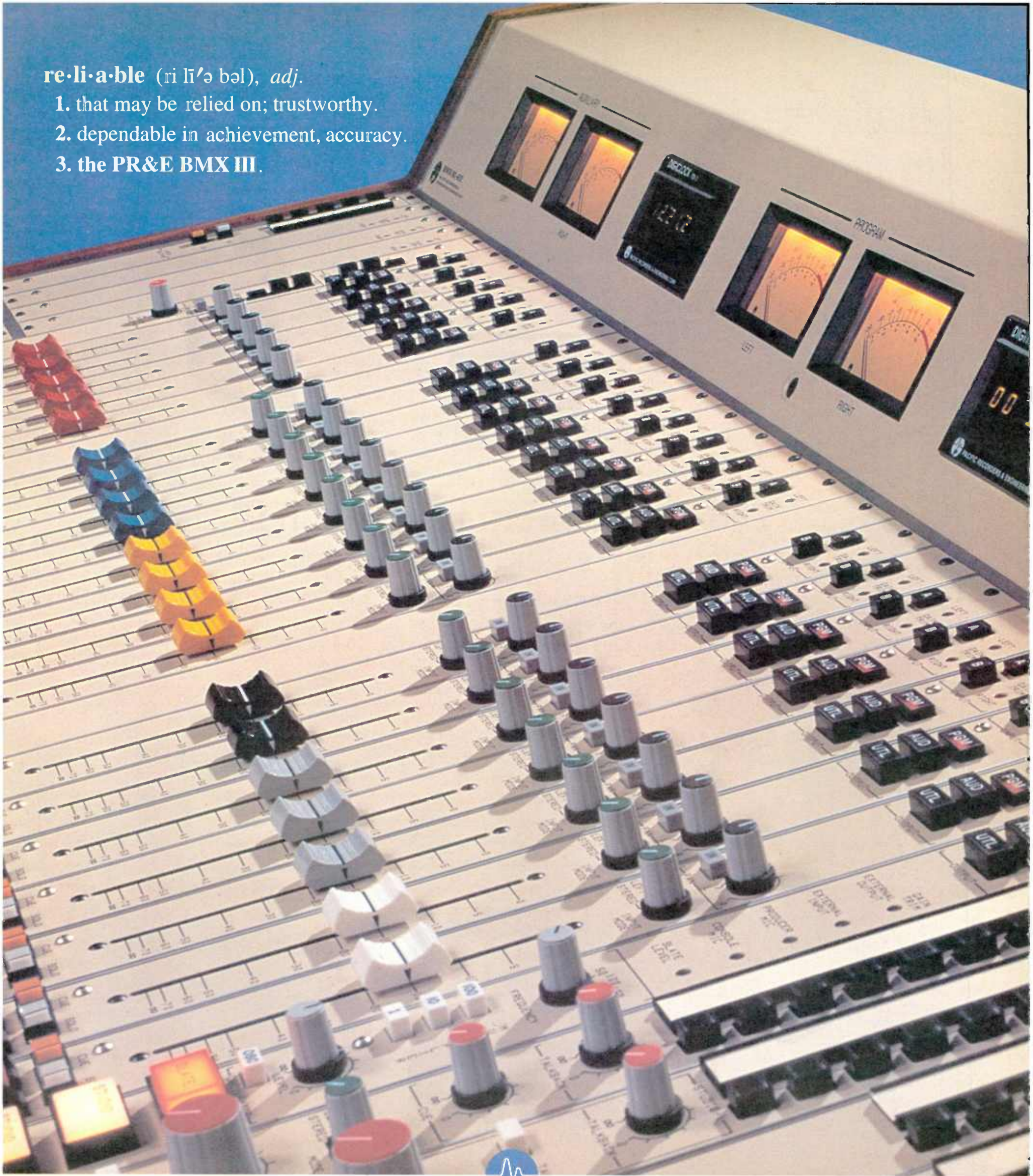
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# Son of Retro Tricks II: Vintage Vocalization

Part II of II

by Alan R. Peterson

**WASHINGTON** The last time we looked at retro-effects in the Jan. 10 RW, the focus was on Leslie speakers, ring modulators and vocoders. All three classic effects still enjoy brief flings of popularity from time to time.

In last year's Beatles Anthology telecast, George Harrison was running music through a Leslie speaker. Magnavox used a vocoder on its logo button of its pre-Christmas TV commercial.

Look at old Devo videos. One of the performers duct-taped a commercial ring modulator to his instrument.

All three effects still have legitimate uses in radio production, both commercial/promo and long-form drama programming.

This time out, we look at two retro effects you can take credit for reviving at your radio studio: talk-boxing and the Sonovox.

## Hose-in-mouth syndrome

"Talk Box" is the name of a specific device manufactured and sold by a company called Heil. Similarly named devices have been built by other companies over the years.

For the purposes of this article, due to the properties and function of the design, the term will be applied generically.

Anyone who has ever played "Show Me the Way" from the "Frampton Comes Alive" album has heard a talk-box. The distinctive wa-wa-wa vocal effect made quite an impression.

You may have seen a small portable version of this device. It is used as an artificial voicebox for people who have had vocal cord surgery.

Talk-boxing is not a comfortable effect to execute. It requires you to hold a hose in your mouth, feed sound up the hose and modulate the signal with your teeth, tongue and lips. Trying to talk with a hose in your mouth can be remarkably cumbersome.

The other end is a lot simpler. A conventional speaker horn driver is acoustically coupled to the end of the hose and powered by an amplifier. The audio source feeds the amp, the speaker sends sound up the hose to you.

The effect cannot be direct-injected into a console. Because your mouth is the filtering device, you need to be close-mic'd for the effect to be recorded.

## Wowie

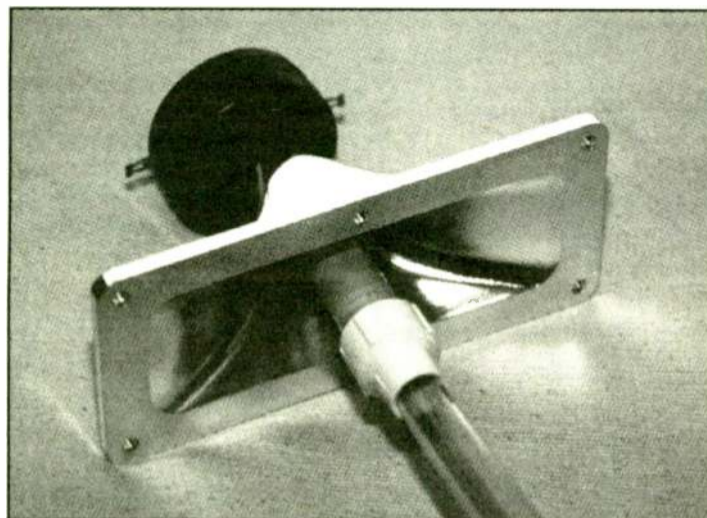
Ignoring the hose in your mouth for a moment, the effect is fun to listen to and does resemble vocoding. Vowel-rich sounds are the most effective; a phrase like "wowie zowie" done with a talk box always records well to tape.

Commercially built talk boxes are durable and sound very good, but the expense may put off your boss. It is possible to construct a budget version if you live near both a Radio Shack and a home improvement center.

The first photo shows a simple device made with a Radio Shack tweeter horn. A short piece of PVC plumbing and a

threaded nipple normally used for electrical wiring conduit are solvent-glued inside the throat of the horn.

A clear plastic food-quality tube is cou-



The Elements of a TalkBox

pled to the driver through this aggregate of parts. The terminals on the driver are connected as any speaker to a low-power amplifier. The audio may sound somewhat thin to you, but will sound very different on a mic.

Assuming you already own the amplifier, total cost for parts should be less than \$30. Expect additional cost if you use a

lower-frequency horn driver of better quality. Ambitious tinkerers may want to enclose the horn in a case or chassis.

Remember, this contraption will be going in your mouth. Use only clear food-quality tubing; anything but this type may be toxic. Clean with antiseptic alcohol wipes before each use.

Keep the tube diameter to one-half inch. It is tempting to assume a bigger tube would equal a bigger sound, but anything wider than this will be impossible to clamp your teeth around.

## The Sonovox

The granddaddy of special vocal effects is the Sonovox. Any '60s boss-jock worth his salt has had a name drop cart done in a sono voice.

This very retro-effect was resurrected during the '80s for Melvin the Computer on the syndicated "Top 40 Satellite Survey with Dan Ingram"

show and the emergence of Z-100 FM (WHTZ-FM, Newark, N.J.).

Clever production people like Dan Taylor of WMXV-FM, New York, turn out sonovox material on request, but JAM Productions' John Walford is the long-reigning king when it comes to this effect.

He has done sono effects for more than

20 years and cut countless tracks both for PAMS Jingles and JAM. His sono skills added sizzle to the original Z-100 Flamethrower and Warp Factor jingle packages.

Sonovoxing predates radio jingle use. According to Walford, "It has been around since the 1940s. It was originally dreamed up by a guy named Gilbert Wright, based out of Chicago at that time."

Walford quotes uses in some Twilight Zone episodes, Disney productions and the 1940 movie "You'll Find Out" with bandleader Kay Kyser.

It was also the secret behind Alvin Rey and his "Singing Guitar." While Rey played an electric console slide guitar, an offstage performer with a Sonovox was mouthing the lyrics.

continued on page 35 ▶

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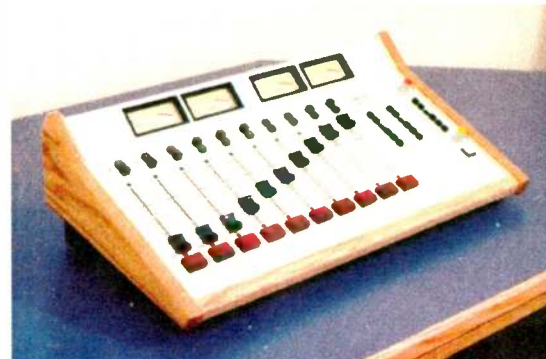
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The 1200 series is a full featured radio broadcast console and is available in five or ten channel models. The ten channel model, featured in this ad, has two stereo outputs: Program and Audition. All stereo outputs feature mono mixdown, and the console has an internally assignable mix minus bus for use with telephone hybrids. Each console channel has a momentary, lighted, on-off switch below the fader which also actuates an isolated start relay for source equipment. The Monitor-headphone system is stereo, selects the main program buses plus two external off air inputs, and features a talkback input with dim logic. Cue is available as Autocue into the monitor system or as an independent output. The console is single input per channel with two unwired remote selector switches of six inputs each, raising the total number of console inputs to 20.

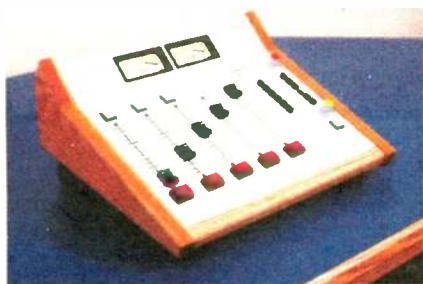
### Performance

Designed for the radio station of the digital '90's, the 1200 series high performance console has a dynamic range of over 100dB which makes it ideal for use with digital audio sources such as CD players and digital audio workstations. High quality mic preamps assures you of the lowest noise and distortion that current technology can provide. Active balanced in and out, the 1200 is the high performance, professional solution to your studio's needs.

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# Easy Techniques for Vintage Vocalization

► continued from page 33

Walford originally credits PAMS Jingles with pioneering the use of the Sonovox for radio, following the device's popularity on commercials.

"There was a very famous Bromo-Seltzer commercial some years ago with the effect of a train chugging the name of the product," said Walford.

"PAMS started using the Sonovox in the early '60s on its Series 18 package for KFWB(AM), and it has just remained around ever since."

### Who sells them?

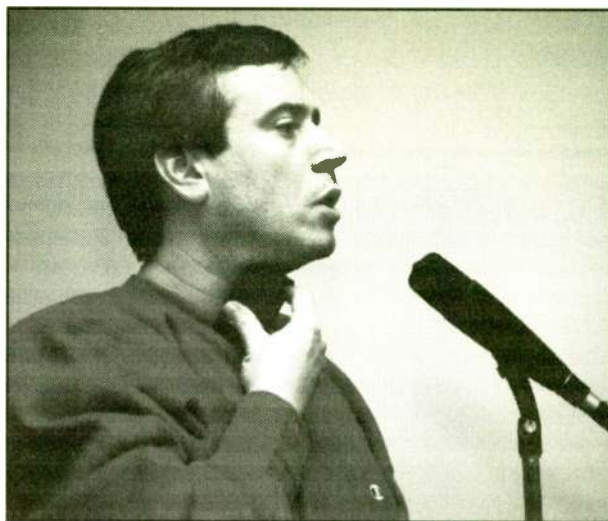
There is no actual Sonovox device manufactured today. Contemporary sonovocalists use homemade sonos or have modified other types of transducers to accomplish the effect.

Owners are fiercely secretive of their

designs, but the basic model consists of a transducer held against the throat and fed a signal from an external source. According to Walford, any recorded source is effective.

**Talk-boxing is not a comfortable effect to execute.**

"A baritone saxophone playing a very long note was used," he explained. "We used an oscillator from a Moog synthesizer. Basically whatever sound you



The Author Demonstrating a Homemade Sonovox

Knowing when to lift the pitch to form a question or drop a tone for a contest "loser!" stinger cart takes a good ear.

It is not a process easily comprehended in one session, which is why masters of the process like Taylor and Walford are available and in demand. And maybe why Sonovoxes are not being built in any great number.

□ □ □

Dan Taylor can be reached at WMXV-FM, New York, at 212-752-3322. John

Walford of JAM Productions, Dallas, can be reached at 214-388-5454.

choose to stick into it — within reason — can be turned into seemingly understandable speech."

When asked about actual performance tricks and the sonic sorcery created by sonovoxing, Taylor and Walford answered much the way guild members would in protecting any trade secret.

"It's magic," claimed Taylor, while Walford warned, "Don't try this at home."

Their warnings are not meant (much) to ward off competing sonovocalists, but to forewarn potential talent of the investment in time necessary to master the device.

According to Walford, "You have to invest a lot of time and effort into perfecting the way you do it. There are a lot of tricks to know: how to construct a sono, generating sounds that will work and knowing how to record it."

Capturing a good sono requires specific equalization, heavy compression and special mic techniques. It also requires rethinking the way consonants are pronounced, when to add sibilance ("s" or "z" sounds) and how to properly "chew" a vowel to sound clear.

Some synthesizer skills are also desirable if the effect is to have color and animation.

Single-tone sono effects are easy.

## 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

### Sound Flag Acoustic Treatment

Acoustic Sciences Corp. (ASC) introduces Sound Flag wall-mounted studio acoustic panels.

According to ASC, the triangular, edge-mounted, corner-loaded panel provides up to six times more noise absorbing power than standard wall panels. Treble range buildup and overload is eliminated while the room stays clear and bright.

One edge-mounted flag is typically mounted every two or three feet on centers around the upper perimeter of the room. Custom angle cuts and larger panels are available from the company.

For more information, contact ASC at 503-343-9727 or circle Reader Service 67.



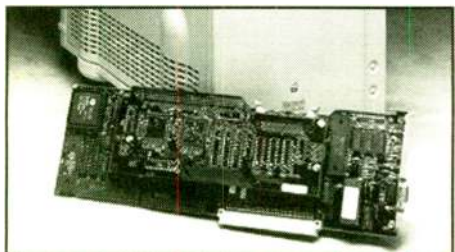
system.

For more information, contact Lexicon, Inc., at 617-736-0300 or circle Reader Service 81.

### Lexicon NuVerb

Lexicon is shipping a new daughter-board for the Mac-based NuVerb digital reverberation processor, making it compatible with the DigiDesign TDM system.

NuVerb is a 20-bit professional reverb system that has been previously available



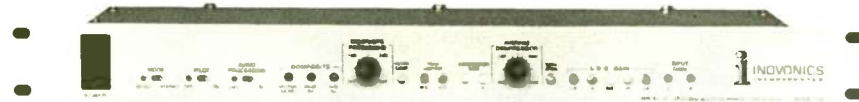
for Macintosh computers.

The TDM option allows users to get into NuVerb directly from inside the DigiDesign ProTools program.

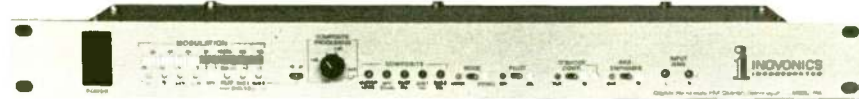
The new TDM package ships with daughterboard and software and is a field-installable option to any NuVerb

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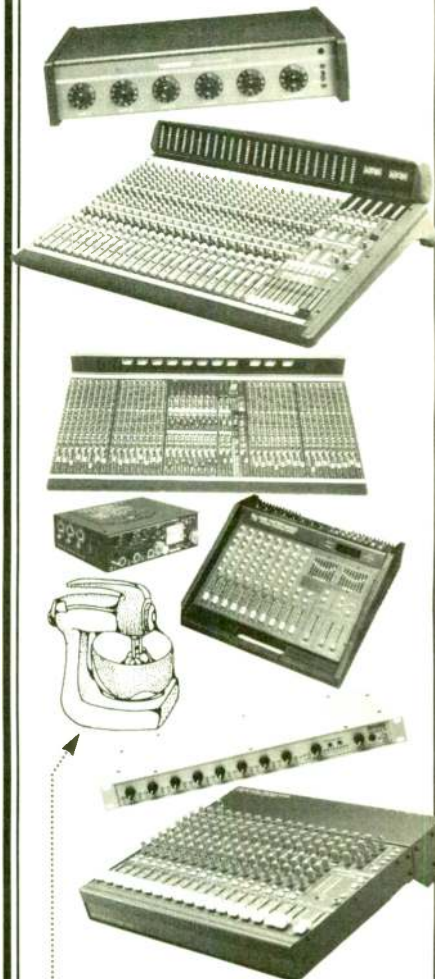
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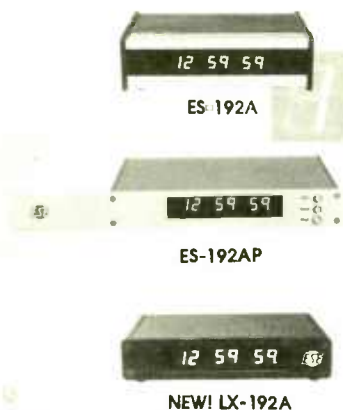
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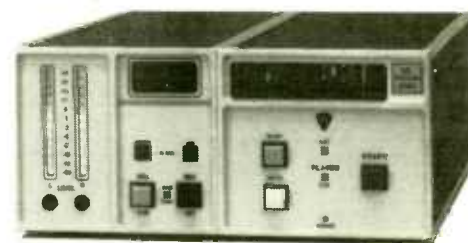
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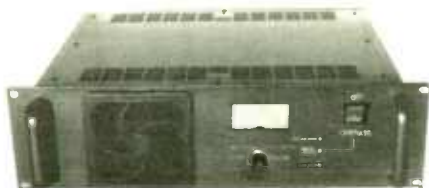
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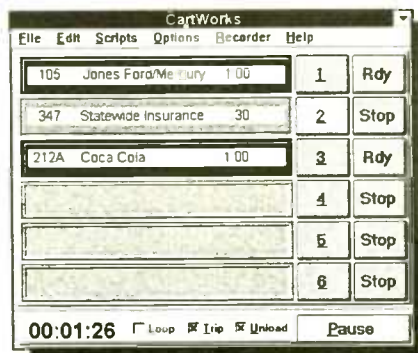
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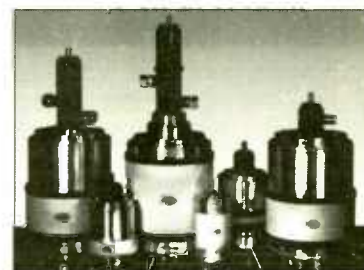
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# MARKETPLACE

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## Digital Display

Five new models of 4-inch high digital displays are available from ESE. Every model features red LEDs that are viewable from 120 feet and are housed in a wall-mount enclosure.



The ES-942 (12 hour) and ES-944 (24 hour) are six digit, stand-alone clocks. The ES-943 (six digit) and ES-941 (four digit) are slave displays designed to read time code from any master clock with an ESE time code output.

For more information from ESE, contact the company in California at 310-322-2136; or circle Reader Service 27.

## Parametric Equalizer

The Model 109 parametric equalizer from Aphex Systems features the company's patented Tubessence vacuum tube circuitry and provides a mode switch that offers either dual (stereo) or mono four-band equalizer configurations in the same unit.

Each channel offers  $\pm 10$  dB of gain, two bands of equalization that each offer  $\pm 15$  dB boost/cut with center detent, sweepable frequency adjustment, variable bandwidth and switchable peak or shelving filter mode. Inputs and outputs are 1/4-inch TRS balanced/unbalanced.

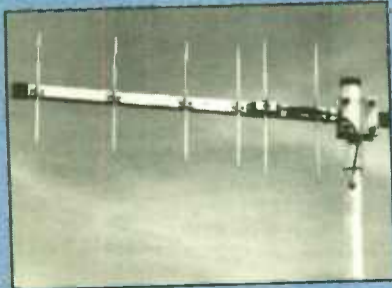
For more information from Aphex Systems, contact Chrissie McDaniel in California at 818-767-2929; or circle Reader Service 25.

## Dual Channel Common

## Heavy Duty Antennas

A new line of heavy duty Yagi antennas from Antennaco features designs that center on a thick-wall square tube boom with a 1-inch cross-section at the core of each antenna. The increase in boom provides additional structural integrity that allows the antenna to withstand higher winds and ice loads.

Each element on the antenna has been upgraded to a solid 1/4-inch rod of high strength aluminum and the custom mounting hardware has been redeveloped to ensure a secure mounting in



either horizontal or vertical orientation.

For more information from Antennaco, contact the company in New Hampshire at 603-673-3153; or circle Reader Service 28.

## Line Coupler

The Dual Channel Line Coupler from Micro Communications, Inc. (MCi) is designed to carry two broadcast signals on a single common transmission line up the tower and then split the signals at the top to feed two different antennas.

An existing coaxial transmission line carrying a VHF or FM signal can be converted to dual use through the addition of dual channel line couplers. Power rating and flange reflections



must be taken into consideration when considering the use of the Line Coupler.

For more information from Micro Communications, Inc., contact Debra Bureau in New Hampshire at 603-624-4351; fax: 603-624-4822; or circle Reader Service 41.

## Seventies Music Library

Available from Halland Broadcast Services (HBS) is the classic rock format supplement to its '70s Gold CD music library. The format includes more than 300 songs from the late '60s and '70s with emphasis on music and groups that were popular on the progressive rock playlists of the era.

HBS' '70s Gold compilation includes 545 AC and Hot-AC hits from the '70s with no disco and can be used in three format categories.

For more information from Halland Broadcast Services, contact the company in California at 800-HALLAND (425-5263); or circle Reader Service 31.

## Multimedia Cable and Necessities Catalog

A new catalog of cable accessories and professional multimedia, data and audio/video necessities is now available from Have, Inc. The catalog features Canare, Belden, Mogami, Neutrik, Switchcraft and Kings bulk cable and connectors as well as several of Have's multimedia cable accessories.

For more information from Have, contact the company at 800-999-HAVE (4283); or circle Reader Service 29.



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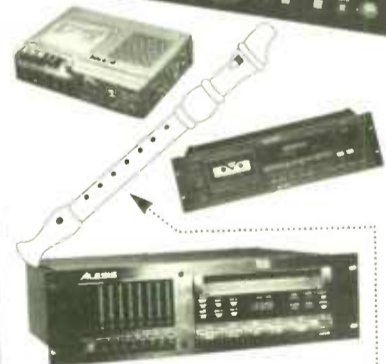
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For more information from Audcom, contact the company in Virginia at 703-379-4412; or circle Reader Service 6.

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# STATION SERVICES

News and Services for Business, Programming and Sales

## Investing in Radio Market Report

**CHANTILLY, Va.** BIA Publications has released its "Investing in Radio Market Report 1996, 1st Edition." The guide profiles all 261 radio markets and includes 1995 Summer Arbitron ratings and, for the first time, audience share estimates for San Juan, Puerto Rico.

BIA is also releasing the 1996 edition of the "Investing in Radio Ownership File" which provides contact information for more than 3,100 commercial radio station owners throughout the United States. The Ownership File covers all 261 markets and details group and individual owners with a profile of their radio holdings.

Also available from BIA is "Radio Rankers 1996, 1st Edition." The reference guide can be used to track station ratings and performance by its critical demographics and most popular dayparts.

For more information from BIA Publications, contact the company at 703-818-2425; or circle Reader Service 138.

## New Features From USA Radio Network

**DALLAS** The USA Radio Network has announced three new features. "USA Health NewsFeed" is a vignette created and produced by Johns Hopkins Medical Institutions and offers daily reports on the latest developments in health medicine, with an emphasis on helping people make good decisions about their health care.

"Road to the White House" is a feature program hosted by Kim Taylor that keeps listeners up to date with the 1996 presidential candidates and their profiles from the primaries through the election.

"A Day in the Life" is a daily feature focusing on that particular day in Beatle's history. Listeners will hear stories behind the songs and headlines as well as backstage anecdotes and Beatles trivia.

For more information from USA Radio Network, contact the company's network affiliate service department at 800-829-8111; or circle Reader Service 117.

## Country Classic Legends

**DULUTH, Minn.** Frank Dell hosts "Country Classic Legends," available from Music Services & Marketing. Dell interviews the legends of country music about their lives past and present. The artists share the stories behind their hit records and relive some of the greatest moments in their careers.

For more information from Music Services & Marketing, contact the company at 218-628-3003; fax: 218-722-5683; or circle Reader Service 85.

## High-Tech Radio Program

**MIAMI** Dave Graveline hosts "Into Tomorrow," a high-tech radio program produced by Advanced Productions. The

program features discussions that center around the latest technology for various products and services and offers listener interaction via phone and e-mail.

For more information from Advanced Productions, contact the company at 305-824-9000; e-mail: [advanced@graveline.com](mailto:advanced@graveline.com); or circle Reader Service 141.

Information about Advanced Productions is also available via the World Wide Web at <http://www.graveline.com>

## The Music Bakery Releases New Production Music

**DALLAS** The Music Bakery has added four new categories to its list of production music. The new categories include Bold Orchestral Scores, Positive Motivational Themes, Warm Romantic Cuts and Unique Contemporary Grooves.

Every CD from The Music Bakery is now encoded for use with AirWorks Media's TuneBuilder software and features a music search feature that selects the right cuts for the user's projects.

For more information and to receive a free demo CD from The Music Bakery, contact the company at 800-229-0313; or circle Reader Service 188.

Information about The Music Bakery is also available via the World Wide Web at <http://www.musicbakery.com>

## Music Library Devoted to the Latin Market

**MIAMI** Available from Nuestro Ritmo is a music library devoted to fulfilling the production music needs of the Latin market.

The first release is a three-CD package available on a buy-out basis. Thirty-three Latin and Latin/fusion full-length themes are included along with edited :60, :30, :15 and :10 second versions of each theme as well as bumpers, transitions and loops.

For more information and to receive a free demo CD from Nuestro Ritmo, contact the company at 800-334-9801; fax: 305-596-5483; or circle Reader Service 108.

Information about Nuestro Ritmo is also available via the World Wide Web at <http://www.musicalacarte.com>

## Premiere Radio Networks Announces Oldies Program

**LOS ANGELES** Premiere Radio Networks will introduce a new oldies program created by Bill Drake and Kent Burkhardt. The program, "Big Daddy's Rock'n'Roll Oldies Club," is a six hour long-form program hosted by "Wild Bill" Scott.

For more information from Premiere Radio Networks, contact the company at 818-377-5300; or circle Reader Service 204.

## TRF Releases New Discs

**CHESTNUT RIDGE, N.Y.** TRF Production Music Libraries released two

new CDs produced for its Bosworth Production Music Library (BOCD), adding to the more than 50,000 selections already in the TRF libraries.

The new releases are "World Sports" (BOCD 187) containing music for sports events and related occasions, recorded with an international feel, and "Light Music and Jazz Archive 1930-1968" (BOCD 188) which takes you through the pre- and post-war years with light orchestral mood music as well as charting the progress of casual dance music, later jazz styles and early pop. All tracks on BOCD 188 are authentic 78 rpm archive works from the original historic Bosworth Recorded Music Library. One recording was originally released in 1929.

For information, contact Ken Gilman at TRF Music at 914-356-0800; or circle Reader Service 130.

## Westwood One Entertainment Opens in San Francisco

**NEW YORK** Howard Silver, former K101-FM sales executive joins Westwood One in its new San Francisco-based sales office. Silver is a 20-year veteran of the Bay area radio market and will oversee the company's new full-service office designed to serve agencies and advertisers in the Pacific Northwest.

For more information, contact Renee Casis at 212-641-2052.

## NPR to Air Works by Corwin

**WASHINGTON** National Public Radio will offer digitally remastered works by noted playwright Norman Corwin. "13 by Corwin" is a star-studded anthology of the dramatist's greatest radio plays hosted by some of America's best known celebrities.

The dramas star Hollywood legends from the '30s and '40s and drew audiences of up to 60 million during radio's heyday.

The series will include: "The Undecided Molecule," starring Richard Benchley, Vincent Price and Groucho Marx; "The Odyssey of Runyon Jones," and "Untitled," introduced by Walter Cronkite and featuring Frederic March.

The series will air on NPR Playhouse. Interested members should contact NPR Marketing at 202-414-2830.

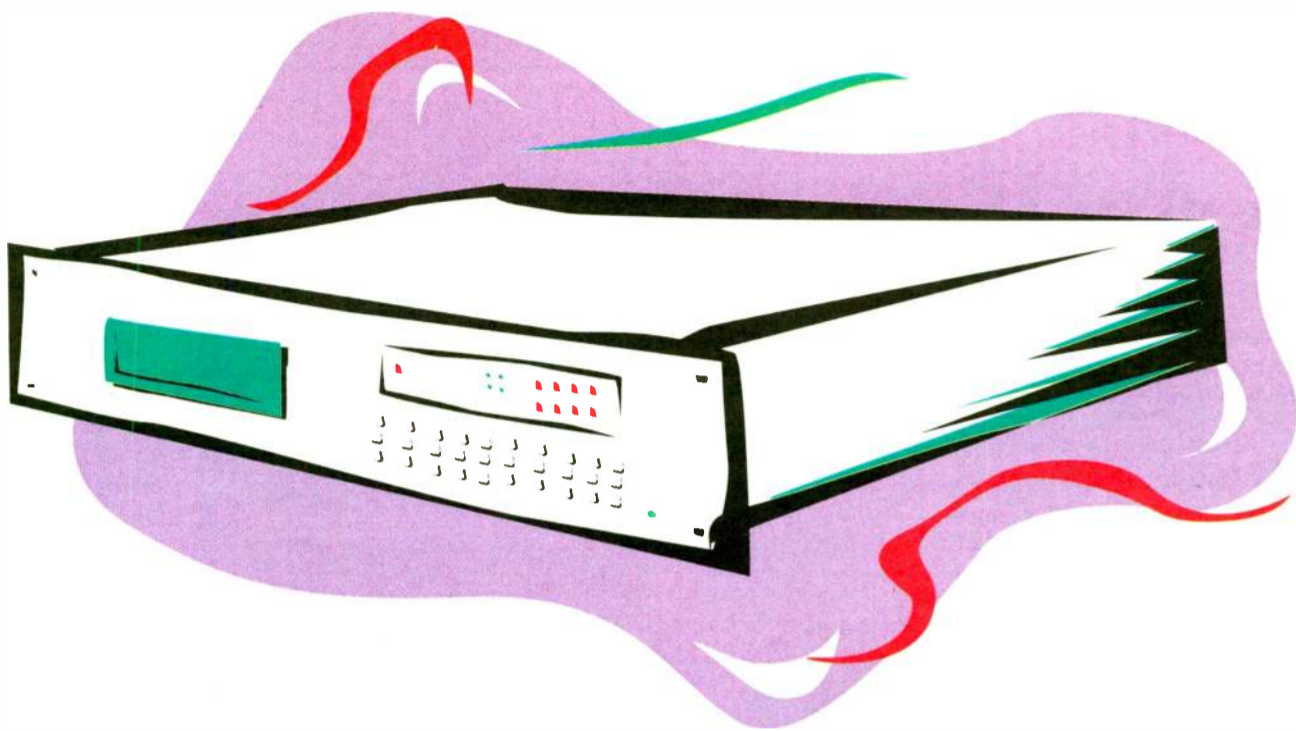
## Digital Courier International to Distribute Premiere Radio Networks

**LOS ANGELES** Digital Courier International (DCI) will distribute all 10 of Premiere Radio Networks comedy networks through its digital network. Radio programs and services, including morning shows, will receive CD-quality comedy features and scripts written and produced just hours before air time.

For more information, contact Tim Kelly at Premiere Radio at 818-377-5300; or circle Reader Service 171.

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**Elvis In 1959:** From West Germany, Sgt. E. Presley could have remotely cut a hit without leaving the base and sent it to an empty studio in Nashville. At 0900 hours in West Germany, Elvis could have automatically started a tape recorder at the closed RCA Victor Studio B and had it ready for final mixing the next morning.



**Walt Disney in 1937:** From three different remote locations, Snow White's Director David Hand could have received voice-overs in stereo from Roy Atwell, Adriana Caselotti and Lucille LaVernes using a CDQPrima™. David Hand's Prima would have received each talent's voice-over, even though each incoming call came from a codec of a different configuration.

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# Running Radio

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**Promo Power:**  
Radio Is  
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**See page 49.**

## OFFBEAT RADIO

### Dolly Parton at Home on the Airwaves

by Dee McVicker

**SEVIERVILLE, Tenn.** Whoever said you can't go home again never really understood the relationship between Dolly Parton and her hometown stations WSEV(AM) and WDLY(FM).

WSEV, a 5 kW on 930 kHz, was the first station to put Parton's velvety voice on the air back in her youth, when she was a gospel church choir singer growing up in Sevierville, Tenn. Later, after that magnificent voice had achieved fame and was known clear around the globe, Parton returned home to Sevierville to purchase an ownership interest in the AM and its sister FM, WDLY, a 530 W on 105.5 MHz licensed to nearby Gatlinburg, Tenn.

#### Home sweet home

And, if that's not the stuff going home again is made of, the fact that WDLY has a studio on-site at the star's Dollywood theme park just up the road certainly is.

Rod Orr, who also holds an ownership interest in WDLY and WSEV, said he felt the time was right to put up a studio on-site at Dollywood, not only for nostalgic reasons, but because it was good for business. After all, where else would WDLY, a country station, be so at home than in Dollywood?

So, in April of 1991, Dollywood opened as usual to the onslaught of tourists, but greeting them on this day was a glassed-in radio studio near the entranceway to the park.

Since then, WDLY on-air talent have

been conducting business as usual from the Dollywood studio, which is enclosed in soundproof windows so tourists can see in and announcers can see out and, every now and then, wave to one another.

On occasion, a celebrity or two ambling past the studio on his or her way to a performance at the park's theater will stop in for a chat. Most of WDLY's on-air programming is from a computerized CD system at the main studio, but announcers at the Dollywood studio keep a CD



Dolly Parton's touch is evident in all the items associated with her radio station.

player on hand should a celebrity happen to bring his or her latest album.

At least a hundred celebrities have made an appearance thus far, including Kenny Rogers, Charlie Daniels and Merle Haggard.

On other occasions, park visitors can get their 15 minutes of fame by stepping up to a microphone located just outside the studio.

The studio is open for business typically sunup to sundown for nine months of the

year, when the park is open. During off hours at the park, the 24-hour station is run from its main studio in Sevierville. It is the only studio that Orr knows of that operates from a theme park full time, at least as full time as park hours will permit.

"One of our former managers kiddingly said it's like running a 10-hour remote," he said.

#### Getting there

Still, as a studio some five or six miles away from WDLY's main studio, there were inherent challenges. Most of the music is played from the main studio on CD, the rotation of which is controlled by Dollywood announcers via high-speed digital phone lines. Announcers at the Dollywood studio broadcast weather, traffic and local event reports — which are "Martied" to the main studio several miles away.

Initial terrain path studies indicated that the 450 MHz Marti path would be marginal, due to hilly terrain.

"It shoots up a valley but there's a hill that comes close to interfering with the signal," said Orr. But to the station's good fortune, actual signal testing proved the signal was strong and clean enough to link the studios.

Not surprisingly, WDLY doesn't have much in the way of competition — at the theme park or otherwise. As a tourist station appealing to thousands of new visitors every day, it has little use for local marketing strategies and even less for Arbitron ratings.

"We specialize in resort and tourist markets. We'd like to be small market broadcasters, but it's tough to be a small market broadcaster and make it with just traditional income these days. That's why we get into these types of markets," said Orr, whose company, Orr and Earls Broadcasting Inc., also owns KOMC AM and KRZK-FM in Branson, Mo., and a cable delivered tourist channel.

WSEV/WDLY is owned by Dollywood Broadcasting, a joint venture between Orr and Earls Broadcasting and Dollywood Corporation.

"Most advertisers are real interested when we say there are 3 million visitors that walk past our door," said WDLY general manager Carol Meadows, claiming that the station's audience could change 5 million people in one day.

That kind of advertising audience is appealing to local as well as national advertisers, and is hard to capture otherwise. It also helps that Dolly Parton is the "voice" of WDLY; she does a majority of its liners and station IDs.

For the park's part, the arrangement offers them a voice to promote the park and relay activities, tips on parking and other visitor-related topics of interest.

"Visitors coming into this market have no loyalty to any station — they're loyal to their stations back home. So, whatever we can do to make them feel good about listening to us, we do," said Orr.

□□□

Dee McVicker is a regular contributor to *Radio World*. She can be reached at 602-545-7363; or via e-mail at roots@primenet.com

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# Help Client Re-evaluate Approach

Part VII

by Ty Ford

**BALTIMORE** In the previous installment of *Radio Spots*, I broached the topic of how to reposition your client's advertising; how, by interviewing them, you can collect their "pearls of wisdom" and turn those pearls into commercials that work better for the client, your radio station and your listeners.

## Establish control

As you begin this process of working closer with the client, it is extremely important to establish control. You want and need the client's input to determine new goals and strategies, but you have to keep them at a distance to prevent them from micro-managing the account.

When the client makes a suggestion that you believe will result in a disservice to them, your station or your listeners, the best way to deal with it is to explain the consequences in simple terms and suggest a more appropriate solution.

This, of course, assumes that you have done your homework and have a clear vision of what will work and what will not. Simply taking the order is no longer good enough. You need to position your station as a "value added" service to your advertisers. You also need to position your advertisers the same way to your listeners.

While the initial client conference can be done over the phone, it is much better to do a face-to-face with the client. Block out some time for a visit so you can let the client give you a tour of the operation and explain how the business works.

Make a note of obvious strengths and weaknesses. Allow enough time for a strategy meeting during which you can help the client establish new goals. The strategy meeting should occur at the client's convenience, in private, without interruption, and should not take more than an hour.

I strongly suggest using a two-person team consisting of the account executive and the creative director, production director or whoever will be writing and producing the copy. Having two people acting as a team sends a strong message to the client that he or she is important, provided that you do not use the meeting to hard-sell them a new spot schedule.

Having two people doubles your ability to collect information and deal with keeping your client on track. If your station does not have a production person, the obvious alternative is to send the sales manager and account executive, or an account assistant.

Obviously, the main goal will be to increase the client's business. To achieve that, you need to create a campaign that brings in new customers and offers more to existing customers. In the past, this could be done with a fairly good piece of copy and a good schedule.

## Something special

This still may work in smaller markets, but the increased competition in medium and larger markets may not provide acceptable results. In those markets the buyer has too many choices.

Say, for example, there are five hardware stores equally spaced in a 10-square-mile area and your client owns

# RADIO spots

one of them. It is going to take something special to lure the customers who are closer to the other four stores over to your client's location. Price is probably not the best lure, neither are special sales.

Sure, you will get some response with a loss-leader, but hoping that you can make up the difference with suggestion-selling of additional items is chancy at best. Besides, price and special sales are both too easily duplicated by the competition.

In any business, sacrificing profit margins to maintain market position usually results in slow death, unless you know for a fact that your pockets are deeper than your competition's.

A ZIP code report from credit card purchases and from asking cash customers for their ZIP codes at the point of purchase can be very revealing.

When your client was one of three hardware stores in the area, the geographical customer pool was a lot larger. Now that there are five stores serving the area, customers have to have a really good reason to go out of their way to

shop at your client's store.

Your client must first accept the reality that its slice of the available customer pie is smaller than it used to be.

At some point, you have to stop worrying about the competition and start thinking about the customer. What do they want? How do they prioritize their lives?

While money is always a major factor, the one factor that is emerging as equally or even more important is *time*.

How much time does it take for the buyer to get to and from the location? Do not forget to include how much time it takes to find a parking place and get into the store. How much time does it take to complete the transaction? Include the ease of finding the product or dealing with service personnel and how long it

continued on page 43 ►

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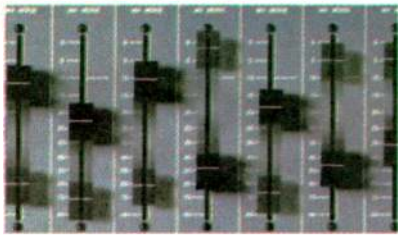


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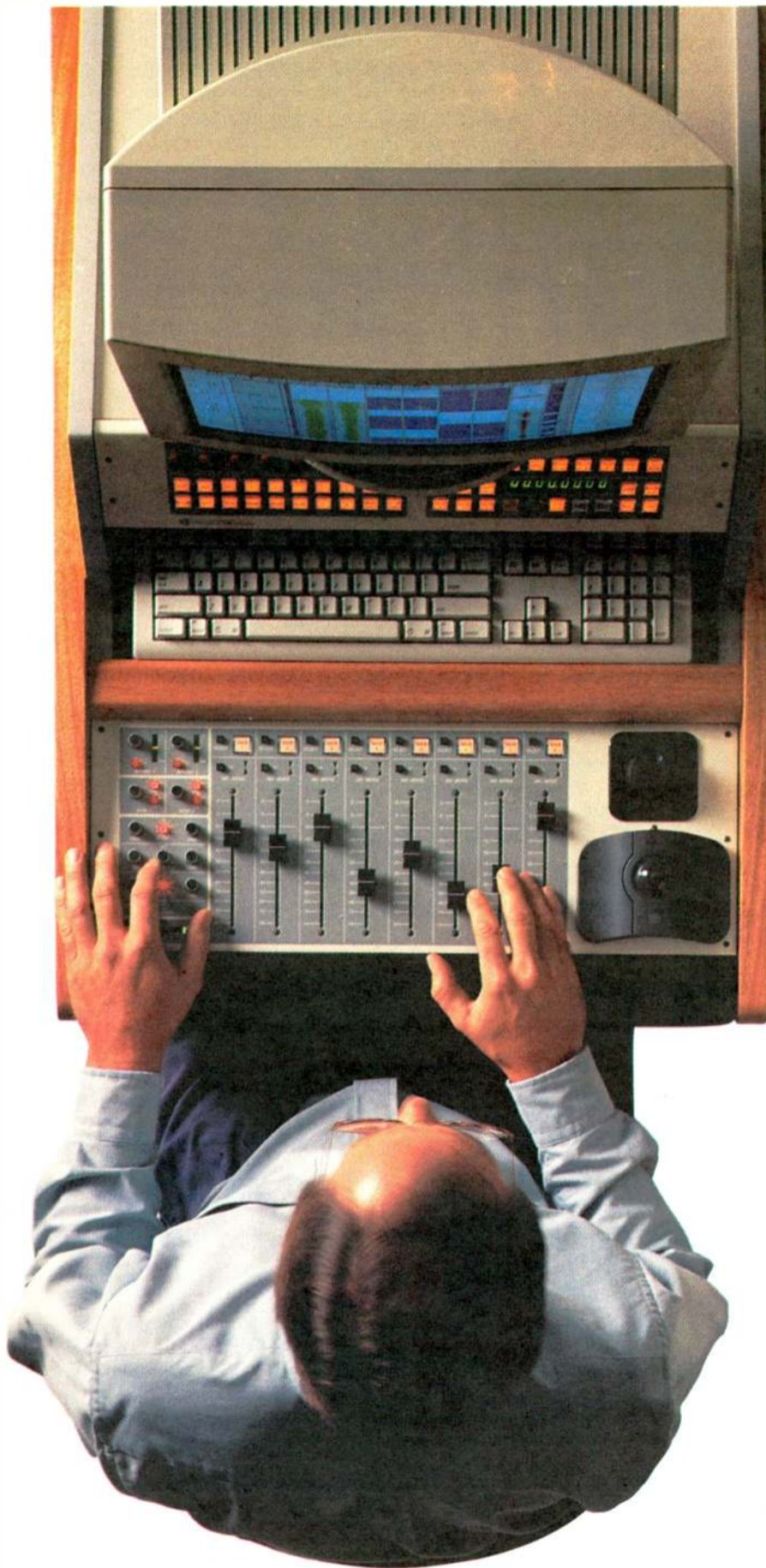
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OF COURSE, YOU HAD TO PROMISE HIM ANYTHING HE WANTED IN HIS NEW STUDIO. IT TURNS OUT THAT WHAT HE WANTS IS A REAL WORKSTATION BECAUSE HE OUTGREW THE TOYS AT HIS LAST GIG. HE NEEDS ONE THAT MAKES HIS COMPLEX PRODUCTION WORK EFFORTLESS. YOU COULDN'T AGREE MORE. AFTER ALL, THE HOTTEST TALENT SHOULD HAVE THE HOTTEST TOOLS, RIGHT?

YOU BOTH DECIDE ON AN ADX. THE ADX WORKSTATION WAS SPECIFICALLY DESIGNED FOR POWERHOUSE ARTISTS WHO CAN'T AFFORD TO WASTE VALUABLE PRODUCTION TIME WITH CREATIVITY-LIMITING TOOLS.

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World Radio History

ROOTS OF RADIO

# Poking Fun at George Washington

by Richard W. O'Donnell

**PORT RICHEY, Fla.** Back during the golden age of radio, the annual celebration of George Washington's birthday provided comedians with material enough for a splendid assortment of jokes and routines.

During the thirties and forties, radio comedians did 39 weekly shows, all of them live, and the material was certainly more up-to-date than it is on your typical taped television show today.

January had its hangover jokes; March, its St. Patrick's Day humor; and September was great for its "How I Spent the Summer" routines. October had Columbus; November, its turkeys; and during December, the airwaves were jammed with Christmas shopping gags.

February was reserved for George

Washington. There was never an abundance of Abe Lincoln gags and the Valentine routines, though often tried, never really caught on. February was George's month.

## Why did George chop down the cherry tree

What follows is a collection of vintage George Washington radio jokes — some good, some bad. It all depends on your sense of humor.

If you are old enough, you may have

heard most of them. If you are not old enough — then judge for yourself.

★★★

Jack Carson was a popular movie comedian during the forties. On his CBS radio show, his nephew Tugwell was played by actor Dave Willock.

Carson: "I'm ashamed of you, Tugwell. When George Washington was your age, he had become a surveyor and was hard at work."

Tugwell: "And when he was your age, he was president of the United States."

★★★

Milton Berle and a lot of other radio comedians used this famous line: "Washington — first in war, first in peace and last in the American League."

In those days, the old Washington Senators always ended up in last place at the end of the baseball season.

★★★  
Abbott: "Well, what did George Washington's father say when he saw his report card?"

Costello: "George, you're going down in history."

★★★

"Life With Luigi," starring J. Carroll Nash, was the story of an Italian immigrant who found happiness in America. Luigi attended school to learn all about the American way of life.

Teacher: "Luigi, who was the first president of the United States?"

Luigi: "George Washington."

Teacher: "Could you be president, Luigi?"

Luigi: "No."

Teacher: "Why not?"

Luigi: "Teacher, you 'scuse me, please."

continued on page 45 ▶

# Controlling Micro-managing Clients

▶ continued from page 41

takes to get through the checkout line.

Here is a great example of the client thinking about the customer instituted by a local car dealer. When you bring your car in for service, a van will take you wherever you need to go, then pick you up and bring you back to the dealership when your car is ready.

How the customer feels about the degree of convenience and the quality of the service during the transaction is as important as how she or he feels about the product or service purchased. Unless your client has a commitment to all of these elements, the best spot in the universe will only work once.

### Try and buy

The new customer will try, but if the process is overly time-consuming and of low quality, they may not buy and may never return.

To bring the thought full circle, these are the same strategies you should be applying to your relationship with your client. Of course, all these good feelings don't mean a thing if the cash register doesn't ring.

Once you get your client through this reevaluation process, you can begin to set goals and determine the approach. Make sure the goals are reasonable. A one-spot-per-day schedule that is supposed to fill the store with people had better contain a pretty amazing offer. And, if it is an amazing offer, the client better be prepared to fulfill the promise based on your listeners' expectations.

If the copy uses tricky language to hide additional costs, you may be setting listeners up for a disappointment. You may get them there once, but they will not come back. To make matters worse, the incident has also compromised the quality of the listener's relationship with the radio station.

What is important is that the client feels a real sense of being involved. Help them make the choices; offer suggestions and be prepared to steer them away from problems with good alternatives. If the client does not have a primary slogan, make that the first order of business. A primary slogan is a strong selling concept of its own. It should help the listen-

er to remember the client's name and position the business against the competition, even before the details of the particular offer.

For example: "The Heartbeat of America — That's Today's Chevrolet." "We Try Harder — Avis." "The Real Thing — Coke" and my present favorite, "ABC Radiator Repair — The best place in town to take a leak."

You will also want to nail down the client's unique selling proposition (USP). What makes what they offer different than the competition. In a crowded marketplace, this can be the toughest point to establish. The client may have had a good USP in the past, but may have lost it to increased competition.

Forcing the issue may cause the client to face an uncomfortable truth: they may have to change the way they do business. At best, you may be able to help them reinvent their business. Do not be

quick to take credit for your bright ideas.

Instead, lay your ideas out and let the client examine and play with them. Who cares if, in the end, they take credit for the process. The real truth is that you have helped them out of a jam by offering a number of solutions.

In the next installment, I will get into the five elements that comprise the anatomy of a spot: concept, copy, performance, production and technical.

Until then, think about the idea that what the consumer actually buys first is the advertisement, how they are treated afterwards determines whether or not they will buy the product or service.

□ □ □

Ty Ford may be reached via e-mail at [Tjford1010@aol.com](mailto:Tjford1010@aol.com) or at 410-889-6201. He will be speaking on this topic at the Country Radio Programmers Convention in Nashville, Feb. 29, 1996.

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# Anything Better?



Actual size shown

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# Broadcasting Live on the Internet

by Alan Haber

**ALEXANDRIA, Va.** Up here in the comfy confines of Haberspace, I am blessedly shielded from the in-your-face weather that Mother Nature (Myrna Rothstein to her closest friends) is sometimes wont to inflict on good old terra firma Earth.

Just days ago, for example, the Washington, D.C., area was smothered by the third largest snowstorm in something like 70 years with as little as 15 inches on the low side and as much as 35-40 inches on the high side. Thankfully, I'm cozy and warm to the

max in the global Haberspace village.

No shoveling, no getting stuck in the car, no sub-zero temperatures for me, just lots of great radio-on-the-Web stuff to report, so let's get right to it!

## Valentine's Day already?

As you read this, it's already been. But, as I write this? Not quite yet, I'm afraid. However, I must tell the world ... I'm in love ... with Classic KING-FM in Seattle, Wash. The folks at KING say they're the first station to broadcast classical music on the Internet 24 hours a day. Look out, 'cause here comes Bachmania!

Thanks to Real Audio version 2.0,

KING is rockin' and rollin' with Bach and Beethoven and their classic cronies in sound quality that's really pleasant to listen to (check 'em out at <http://www.king.org>). A 28.8 modem and a solid Internet connection work best.

I'm really impressed and excited because I think that radio stations will greatly benefit from broadcasting on the Web. For one thing, think about the increased audience! Some of you may be thinking that this will take away from the traditional way of receiving radio – on an actual radio – but remember that, as long as a station's signal is being received by a person, the end result is the same whether that person is listening on the Web, through a stereo system or in a car.

I envision a time – it's hard to say how long down the road, but I'd venture to say it'll be sooner rather than later – when people will be able to sit down at their computer or some sort of terminal and connect to a site from which they will be able to link to radio stations all over the world.

Ted Kelly, promotions director of oldies giant WCBS-FM in New York City, which is about to hit the Web with 24-hour broadcasting via Xing Technology (check next month's Haberspace for the complete story), said it best. The station's slogan is currently, "New York's Oldies Station," but Kelly said that going on the Web makes the station "the world's oldies station!"

My advice? Get those servers installed and get started now. It's only going to be called the new frontier for so long. Your listeners – both current and potential, local and worldwide – will thank you for being there at the start of what may well turn out to be one of the most exciting developments in signal distribution ever.

You heard it here – maybe not first, and definitely not for the last time, but you heard it here.

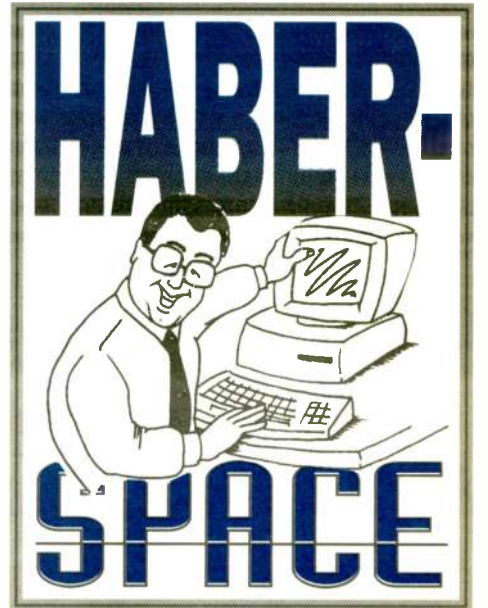
## Neat-o site of the month

It's gotta be Classic KING-FM, which has dared to go boldly where lotsa other stations are going to be going sooner than you think! Bravo, KING! Hail to the ... oh, never mind! Just hail!

What I did on my winter vacation. I spent

it surfing the web! Nirvana! First, I checked in at a pair of rockers. I sat a spell at Jackson, Miss., rocker WSTZ-FM's site at <http://www.teclink.net/z106/>. There's not much going on there yet – just an e-mail drop and a list of cool links – but I sure do like the look of the home page and plan on stopping back soon.

I also spent time at Rantoul, Ill., rocker WZNF-FM's site, which has a really cool home page – the links are rocks (the physical kind) of various types. Plenty of sta-



tion info here on nicely designed pages. And this site has the cleverest-yet presentation of jock pix – they're silhouettes sitting next to the appropriate bios! Well done, and well worth your time checking it out at <http://www.prairienet.org/rock953/homepage.html>.

## Mail's here!

Now, let's dip into the mailbag. C. Gould, engineer at WNCX-FM, WENZ-FM and WERE-AM in Cleveland, Ohio, e-mailed me to remind everybody out there in Haberspace to check out "The End's" Web page at <http://www.americaast.com/wen.z>. Done, C. Lots of station info available for perusal (although the purple links against the black background make things a little eye numbing for me). The custom background on the playlist page (where artist names are linked to their Web sites) features a cool kid indeed, and, fittingly, it's pretty cool!

I heard from Eric C. Weaver, chief  
continued on page 50 ►

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# Presidential Humor on the Radio

► continued from page 43

I vera busy. Worka kin day."

★ ★ ★

Fred Allen: "All right Senator, if George Washington was alive today, why couldn't he toss a silver dollar across the Potomac?"

Senator Claghorn: "Because a dollar

Duffy. But Miss Duffy his daughter, played by Shirley Booth, was on hand.

Miss Duffy: "Why did Washington stand up in that boat, Archie? Why didn't he sit down?"

Archie: "I don't know. Maybe he thought if he sat down, somebody would hand him an oar."

chop down the cherry tree, daddy?"



Eddie Cantor

Daddy: "Stumps me, Snooks."

★ ★ ★

The late Joe Penner of "Wanna buy a duck" fame had Ozzie Nelson as his orchestra leader and Harriet Hilliard, who later became Mrs. Nelson, was the vocalist. On one show, Penner played Washington and Nelson was an innkeeper at Valley Forge.

Innkeeper: "We haven't got an empty room George, but the attic is empty."

Washington: "That's all right."

Innkeeper: "You'll have to make your own bed."

Washington: "That's all right."



Crossing the Delaware

doesn't go as far as it used to in the good old days, son."

★ ★ ★

That silver dollar George tossed also inspired a Jack Benny routine.

Benny, playing George in a sketch, has just tossed a silver dollar into the river. For a second or two, there is a deadly silence.

Benny: "What have I done?"

A loud splash is heard.

Rochester: "Come back Mr. Benny. You'll never find it."

★ ★ ★

"Lum and Abner" operated the Jot 'Em Down store. They were constantly arguing over this or that. On this particular show, they were discussing the War Between the States.

Lum: "Supposing the Southern states had won, and the Confederacy became an independent country — what would Washington have been the father of then?"

Abner, after thinking it over: "Twins!"

★ ★ ★

Fibber McGee: "George Washington was lazy."

Molly: "Never heard that before."

Fibber: "Ain't you ever heard of all those beds he slept in?"

Molly: "Never believed those stories. If he was lazy, we'd never have won the Battle of Bunker Hill."

Fibber: "We lost the Battle of Bunker Hill, Washington wasn't there."

Molly: "Why that loafer!"

★ ★ ★

Edgar Bergen: "George Washington's father was a very gentle man. Why do you know he didn't spank George when he chopped down the cherry tree?"

Charlie McCarthy: "Maybe that was because George still had the ax in his hand."

★ ★ ★

Eddie Cantor: "When crossing the Delaware, why did George Washington stand up in the boat?"

Mad Russian: "His pants were to tight?"

★ ★ ★

Duffy's tavern was a mythical drinking spot presided over by Archie, the manager, played by Ed Gardner. You never heard

★ ★ ★

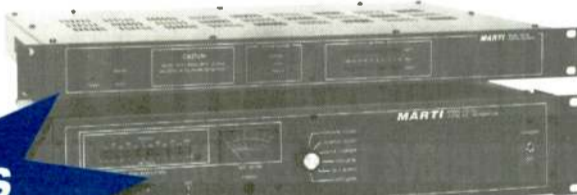
Fanny Brice played "Baby Snooks" on the radio for years. Hanley Stafford was her long-suffering father. From time to time, he did manage to get in a good joke of his own.

Snooks: "Why did George Washington

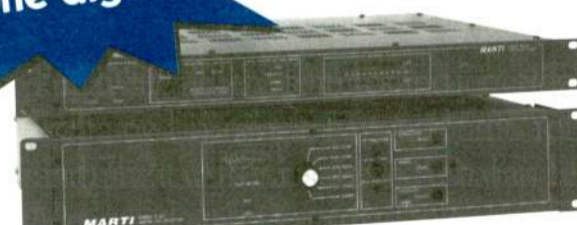
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Innkeeper: "Fine. You can start right now. Here's some wood and a hammer."

Washington: "You nahh-stee (nasty) man!"

It should be noted that "You nahh-stee man!" was a line Penner used every week to bust up his audience out there in radioland.

There you have it — a collection of old-time George Washington radio jokes. From five or six decades away, they may not seem as funny as they did in the old days. But way back when, they were side splitters.

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# WORKBENCH

## Help Fix a Problem Transmitter

by John Bisset

**SPRINGFIELD, Va.** Some of the easiest troubleshooting tips can be forgotten in an emergency. This is especially true when it comes to three-phase power. Not only is the subject sobering (it can kill you), but the backflow of current through a three-phase load can lead to an erroneous diagnosis.

For example, if you suspect a blown fuse in a three-phase disconnect, don't try to find the fuse by measuring the voltage from each phase to ground. The load connected to the circuit may still show voltage, causing you to really scratch your head. Instead, try measuring the voltage across each fuse. A normal fuse will show no voltage reading because the fuse has no appreciable resistance. The fuse that has blown, on the other hand, displays a very high (infinite) resistance — across which a voltage will develop.

★ ★ ★

Here's a brain twister we got from an engineer writing to our America Online address. It involves a Gates FM 20 H3 transmitter. We'll print your replies here; any assistance would be appreciated. The

factory tune-up data showed the power output at 21.5 kW. However, with new tubes and retuning, the most the rig would put out was 19.3 kW, with 30mA of screen current. The factory spec on the screen for this power output is 90mA, but the maximum screen current was 40mA. The screen voltage, bias and IPA drive were all normal. Filament voltages were measured at the tubes and they were on the money too. The values of the screen resistors (and any other components in the circuit) were measured and all read properly.

The neutralization was checked and, as a sidebar, if you have this transmitter, you'll want to make a correction to the manual with regard to neutralization.

The factory data may show the neutralization flag five-eighths of an inch from the tube; however, the manual contradicts this — saying to never get the flag closer than one inch. According to Harris service engineers, once the Bakelite shield was added, the flag could be positioned closer, and in many cases needs to be closer than one inch. The precaution is not to let the flag touch the Bakelite shield or arcing can occur. On this transmitter, the flag can get as close as one-

fourth inch with no arcing.

Anyway, back to our problem transmitter. The couple of things we thought of — filament voltage and screen resistor changes — didn't solve the problem. Any practical ideas will be reprinted in future *Workbench* columns. I mention practical because I'm sure we'll hear

Kandy using the new Atlanta area code: 770-425-0630.

★ ★ ★

Everyone likes a happy ending, and we'll wrap up this column with just that. In the Dec. 13, 1995, issue of *RW*, we discussed the numerous problems broadcasters have had with the Tone Commander Model 220 NT-1, typically used with the Telos Zephyr. We explained that the company's customer service department had given us (and other engineers) the brush-off in trying

**If you have this transmitter, you'll want to make a correction to the manual with regard to neutralization.**

from those who'll write, "It's only a couple of kilowatts ... who cares, it's only FM!" I'd agree, but you know general managers and program directors.

★ ★ ★

One of the first entries in state-of-the-art non-tape-based automation systems was the Ultimate Digital Studio from TM Century. This system depends on the Sony CDK-006 60-disk jukebox to provide the music. The weak link, however, is if you lose a jukebox.

If your station uses the CDK-006 machines, either in the TM Century system or in some other system, before you begin to shuffle your CDs and try to make do with one jukebox fewer, give Brian Falatovich a call at JBA Electronic Services. Brian's company will inaugurate what we'll call the Radio World *Workbench* Resource card file.

Periodically, we'll print the names of start-up or obscure service companies that should be a part of your contact card file. If you have someone to add to the list, let me know.

Brian's company qualifies, as he was the senior service engineer at Sony's repair depot for the last eight years and cut his teeth on the CDK-006. He knows this product inside and out. Not only is his newly formed company providing service for the jukeboxes, but he understands the urgency of broadcasters and can provide you with a rental jukebox while yours is being repaired.

For a limited time, you can buy new jukeboxes (in unopened boxes), complete with a full warranty, for \$1,000 plus shipping and tax. If you want a spare for the shelf, this is a great opportunity at a substantial discount.

Here's the information for your card file: JBA Electronic Services, Inc., 8021 West 119th St., Palos Park, IL 60464; 708-448-7539; fax: 708-448-7678; contact Brian Falatovich; services Sony CDK-006 jukeboxes. For more information on JBA's services, circle **Reader Service 205**.

★ ★ ★

I've answered all the replies we got to our mention of Kandy Clark and Broadcaster's General Store as a source for MCI spare parts. Unfortunately, her number was omitted from that column. If you are in need of spares for your MCI JH-110B machines, you can contact

to solve problems with reliable performance of the NT-1.

After speaking with the company's marketing spokesman, Norton Lovold, a different picture emerged, which we wanted to share with readers of this column.

First, Mr. Lovold freely admitted that the Model 220 could misbehave. The company has over 30,000 of these in the field and in some situations, when the ISDN line passes through a repeater, some of the data received from the repeater can be interpreted as a command to shut down.

The Model 220 is a top-of-the-line full-mainframe NT-1, designed to be a full diagnostic tool. Herein lies the problem. Though the Model 220 was designed to ANSI specs, in some real-world cases, data being fed from the repeater is misinterpreted, causing the NT-1 to "turn off." Less expensive NT-1s manufactured by Tone Commander, which largely ignore all but the most basic data from COs or repeaters, don't have this problem.

By the time you read this, Tone Commander will have finalized a software fix that will permit the Model 220 to ignore the errant repeater data, thus correcting the problem.

In addition to offering a very sincere, public apology to stations that have lost revenue due to wayward Model 220s, Mr. Lovold has asked that his company be given the chance to "make things right" for these customers. This includes free software upgrades to owners of the Model 220 to correct the problem.

Customers who have experienced problems or desire the free software are encouraged to contact Norton Lovold at Tone Commander. His toll-free number is 800-524-0024. Mr. Lovold's e-mail address is tcs@halcyon.com. If you're traveling the Internet, look for Tone Commander's Web page — it has information on the full line of NT-1s.

□ □ □

John Bisset is a principal in *Multiphase*, a contract engineering service company based in Washington, D.C. He can be reached at 703-323-7180. Published tips and suggestions qualify for *SBE* recertification credit. Fax them to 703-764-0751, or send them via America Online at [wwwbench@aol.com](mailto:wwwbench@aol.com)

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World Radio History



## PROMO POWER

# Take a Chance on Something New

by Mark Lapidus

**FAIRFAX, Va.** "Hey, Mark, does your company own that modern rock station I heard while I was traveling through Atlanta last week?"

I get questions like this all the time from my non-radio friends. When they hear a similarly formatted radio station to one they know I work with, they assume it's owned by the same company. It's hard to explain to them that similarity has nothing to do with ownership. It has everything to do with narrowcasting, formats, consultants and the standardization of American broadcasting.

## Copy cats

Formatic radio in the United States has been the norm now for decades. Its prevalence has grown in such a way that even small markets mostly copy a specific format that has seen success in a major city. This formula approach seems to be beneficial.

The record companies love it because they can manipulate product being played on the same type of stations. Consultants love it because they devise a playlist, promotions, marketing and even a name for specific formats and then sell them to owners. Owners love it because it's easy to understand and implement and it sells well. Even listeners — the most important part of this equation — love it because they can find these formats wherever they travel and even see the same types of music played on specialty music TV channels.

So, what's not to love? The main problem is that until shares begin to drop for a format, a "by the book" approach can hamper creativity and risk-taking. Why try anything new when the standard approach is working?

The answer: Formatic radio has made most stations sound pretty good! Your station will do little to differentiate itself from anyone else if you forget that radio is show business. In show business, people are always trying new things. If it works, it stays ... if it doesn't, the show changes or closes.

To get you started on the path of doing things a little differently, examine these

tactics and then devise some of your own.

Think of audio as theater.

**IDs:** Most formatted stations have big voices or imitations of big voices that say the call letters with some sort of sound effects. This has become the boring standard. When you make the decision that you need something more than this, you'll find that maintenance of whatever you devise is the challenge.

If you don't have a production director, assign one of the jocks to be in charge of your station identifiers. Have them done by listeners on the street or local celebrities, or find a celebrity impersonator. Create enough of this material so that you can rotate it for long periods of time without too much repetition.

**Promos and spots:** Never cut just one promo for anything; always do at least two different versions. Instead of always using DJs, can you tie in with local actors to help you out? Perhaps if you find one troupe that needs regular promotion, you can make an exchange. Actors do sound different than radio people; that is why many top agencies will not use voice-over talent from radio. As an industry, we are too often one-dimensional when it comes to promos and commercials.

## Wasted opportunity

**Interviews:** As a rule, local radio — regardless of market size — does a horrible job with interviews. Just because a DJ is good at introducing records or quipping about the day's news, it doesn't mean that person knows how to ask intelligent questions or even how to listen properly for answers.

Even when questions are good and the interview comes out fine, we mostly waste the opportunity. Why? Because we conduct the interview in the long form and air it once.

Advertisers and the music industry realize that radio is a frequency medium. They want spots and music played a lot over time so more people will hear them. It's a rare station that will take a great interview with a core artist and cut it up into one minute segments to air throughout a day. Or, better yet, do the long form interview once, then use the segments to promote the next day's morning show, features, etc.

Think of promotion as entertainment.

**Picking promotions:** When selecting your four big events (one per quarter) each year, only select those events that your core audience would buy tickets to see. This doesn't mean you have to sell tickets. This is just a product exercise to make sure that what you've picked deserves your major focus.

Sure, a blood drive is a terrific event and you should do one. However, it's not worthy of a month-long promotion. What is? That depends on the interest of your target audience. Ask them how they spend their free time and money on entertainment and they'll tell you! For

example, they may do more with their children than you realize. Your sales department may already have this information in their qualitative reports.

**On-site:** For appearances, do you have a three-ring circus or just a van with banners and a box of prizes? Tie in with a local amusement company to be wherever you are with velcro-jumping, moon-bounce, sumo wrestling or computer games. Always serve free food, even if it's just hot dogs and chips.

Think of weekends as image time.

**Receptiveness:** In terms of time and spirit, people are free on weekends. Advertisers know this. That's why every car dealership in the world wants a Saturday remote. The norm is that stations put on underqualified part-timers,

continued on page 56 ►

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# Catching a Cyber-buzz in 'Vegas

► continued from page 22

And, speaking of modems, manufacturers were pretty open about admitting that 28.8 modems were close to the maximum speed obtainable on standard phone lines. The next leap in speed will come only on ISDN phone lines. If you are not contemplating ISDN phones in the near future, feel confident in buying 28.8 units for use.

Of course, the modem companies have added something. Companies like Hayes and Best Data will have modems coming in the first quarter of 1996 that will let you send voice and data simultaneously.

The demonstration at Best Data was impressive: you could draw on the screen or point to something while talking to the

person on the other end. This should be great for technical support.

## Easing into Win95

Those of you who are converting over to Win95 will be happy to know there are a number of utilities designed to help make your programs run better. Symantec has a range of utilities specifically updated for Win95, including the famous Norton Utilities and the new Norton Navigator.

Among its features, it bridges Windows 3.1 and Windows 95 by adding long filename capabilities to most Windows 3.1 applications.

First Aid 95 from CyberMedia is designed to look for and identify the most common problems in upgrading

Windows programs, fixing many of them automatically and getting you back to work.

Touchstone's WINCheckIt 4.0 for Windows 3.1 and 95 continues this company's reputation of providing high quality diagnostic software. Included is a technical library on CD-ROM.

Viruses can be a problem as you upgrade. Both Symantec's Norton Anti-Virus and Dr. Solomon's Anti-Virus Toolkit look for and neutralize the new 32-bit viruses. Dr. Solomon's product has also taken note of the increase in on-line and macro viruses.

It seems some hackers have discovered a way to "file attach" the hidden file "AOLGold" to e-mail sent anonymously

to subscribers. Programs like this can destroy files on your hard drive.

Even if you don't have a modem, new viruses have been found in macros designed to be used with major word processors. You might want to consider whether an anti-virus program would be a protective measure for you.

## Happy ending

Well, we cannot leave you with that sort of negative news. So, how about some positively motivating material? Insights Software has taken some best selling motivational books and put them on CD-ROM.

To make them more useful to users, highlights or powerful quotes from books like "Chicken Soup for the Soul" are brought up each day to reinforce the lessons learned.

Me? I've had enough work for now. So, I will now turn on my new escape valve: Monty Python's Complete Waste of Time from 7th Level.

Filled with the wit and wisdom from the famous BBC series (including some classic video clips), this is silly enough even for me!

□ □ □

Barry Mishkind can be reached at 520-296-3797, or [barry@broadcast.net](mailto:barry@broadcast.net) via the Internet. Check out his home page at <http://www.broadcast.net/~barry/>

## Broadcasting Live on the Internet

► continued from page 44

engineer at KFJC-FM, which beams great sounds and info out of Foothill College in Los Altos Hills, Calif. The station's site – at <http://www.kfjc.org> – has a nicely designed home page. I've been seeing a lot of white backgrounds lately, and I must admit, with spiffy art, they look rather spiffy, as this one surely does.

Scott Fybush let me know about a site he helps run, called the Boston Radio Archives (<ftp://radio.lcs.mit.edu/radio/bostonradio.html>). It's A to Z all the way, and lots of fun, so don't forget to check it out. There's a similar site in operation at <http://www.univox.com/radio/> that covers the southern Florida area, and another, at <http://radio.aiss.uiuc.edu/~rrb/radiodial.html> – headlined "Your Market's Radio Dial Goes Here" – that offers a listing of call letters, frequencies and formats for various stations and cities around the country. Say, while I'm on the subject, how about some other regional radio sites popping up, especially for smaller areas in the country that haven't had their stories told very often?

Also doing the e-mail thing recently was Dave Graveline, host of "Into Tomorrow," a technology program that is broadcast every Saturday morning from 10 a.m. to noon, EST. (The show's local affiliate is WFTL-AM in Fort Lauderdale, Fla.) The show has its own Web page at [http://www.graveline.com/int\\_o2.html](http://www.graveline.com/int_o2.html).

## The hits just keep on comin'

Hits to your station's site, that is. Keep the e-mail coming about your station's site. My address, as always, is [zoogang@ix.netcom.com](mailto:zoogang@ix.netcom.com). By the way, Myrna says "Hey!"

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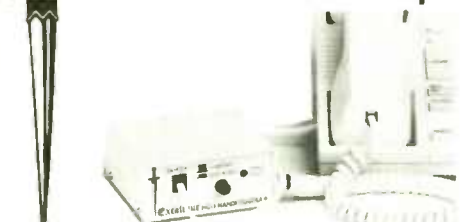
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READER SERVICE NO. 51

# Find the Perfect Operating Level

by Jon Banks

*Editor's note: Readers following this three-part series assumed they missed Part 1 and have been asking us for reprints. Actually, it was inadvertently left out of RW due to space considerations. The inclusion of Part 1 here completes the series.*

**ROCKVILLE, Md.** It is confusing when people use terms like signal to noise, headroom, peak level, standard level and 0 VU. These are very slippery words; their meanings seem to change with each user.

Yet a clear understanding of these terms is important to both system users and designers. Here, I will try to set down the basics in this first article and go into more depth in the next two installments.

In the real world, if we were to take the audio from a whatzit and send it to a gizmo, the audio needs to be transferred at a level appropriate for both devices. Note Figure 1.

and use a new term: *nominal level*. This will mean we are using a standard VU display, audio typical for this circuit and that the meter is bouncing near the 100-percent red/black boundary most of the time.

Now, take the audio away, send a tone at exactly 100 percent on that same meter and measure the level on the circuit with a good RMS AC voltmeter. That is the nominal level: the average level of the audio that is on the circuit in normal operation.

What we must do is pick a nominal level that is below the clipping threshold enough to avoid distortion. How much is enough? That depends on the peak content of the audio on the circuit. Allow that amount for headroom and the signal to noise ratio will depend on how much of that dynamic range is left.

Because we want to pass high quality voice and music from various sources, we will allow 20 dB for headroom. Our peak level from before was +26 dBm so it is

TABLE 1:

### Typical Headroom Requirements

SOURCE	HEADROOM (dB)
Pop CD audio	15 - 20
Male voice	30
Other voices	20
Cassette tape	8
Top quality cart	13
Composite baseband	2
Other music	20

est peak level and the highest noise level. Pads or amplifiers are needed between devices to avoid this problem.

Ideally, we will set up our devices so an audio signal reaches peak level in all parts of the chain simultaneously, as shown in Figure 4. This will maximize the dynamic range of the system. I prefer to align peak levels, because noise levels are harder to measure. They can also vary in RF environments and will change as the power supplies age.

We still need to ascertain the amount of headroom to allow above our nominal levels. If we have recorded to tape, our peak capability is limited by the saturation of the tape itself, so we need less headroom for playback. Digital recording has an absolute peak level — when all the bits are 1's — so that becomes very predictable.

Note in Table 1 the differences between nominal level and peak level for some common types of audio.

With this part now taken care of, look back into the previous articles on dynamic range. There we discuss the peak capability of typical audio circuits and how to measure peak capability when it cannot be determined by inspection.

□ □ □

Jon Banks is chief engineer of WARW-FM in Washington.

## There are only two important levels we need to know about any piece of equipment: noise level and clipping level.

If we have too much level, we will overdrive the gizmo's input and get distortion. If there is too little level, we will have to run the gizmo wide open, which sucks in all the noise.

There is a happy medium, but how do we find and measure it?

There are only two important levels we need to know about any piece of equipment: noise level and clipping level. Once we know those two, we can select any operating level somewhere in between.

For the whatzit, clipping level is when the audio is so hot coming out we just start to get distortion on the audio peaks. For the input of the gizmo, clipping level is the hottest level that can be fed into the input without overloading the first stage — adding more clipping and distortion.

The noise level of the whatzit's output and the gizmo's input is how much hiss, buzz, hum and general garbage is generated for a given setting of the level controls.

The great space between these two extremes is called the *dynamic range* of a device.

Suppose the whatzit device can output an undistorted sine wave at +26 dBm; when we turn off the oscillator connected to the input, a noise meter at the output measures -72 dBm. That means a very respectable dynamic range of 98 dB.

This concept is so important it requires a diagram. See Figure 2.

So we know the peak level, and we know the noise level. How do we define and choose our *normal* operating level? Trick question. It depends on what type of audio you are using and what type of meter you are looking at.

First of all, I do not want to get into the difference between 0 VU, 0 dBm, 0 dB and the rest. Instead, I am going to cheat

possible to choose +6 dBm as our nominal level, but that is very nonstandard.

A better choice would be +4 dBm instead, giving us 22 dB headroom. So now we will calibrate our VU meters so a +4 dBm sine wave reads 100 percent on the scale.

The dynamic range was 98 dB, less the 22 dB set aside as headroom, resulting in 76 dB of signal-to-noise. Not bad.

In Figure 3, look what happens when two devices with the same dynamic range but different peak levels are connected. Notice the reduction in the dynamic range when limited by the low-

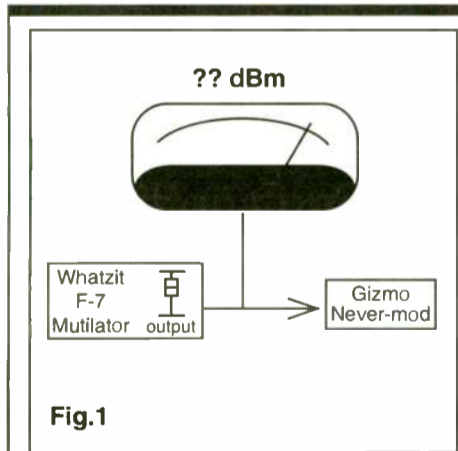


Fig. 1

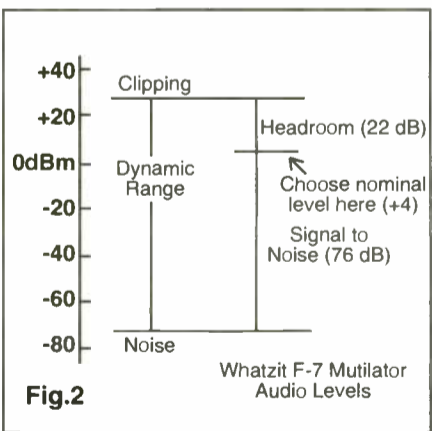


Fig. 2

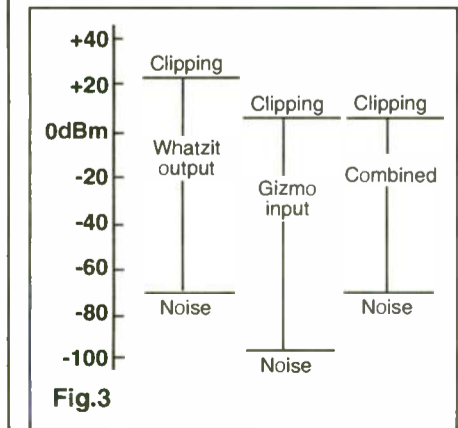


Fig. 3

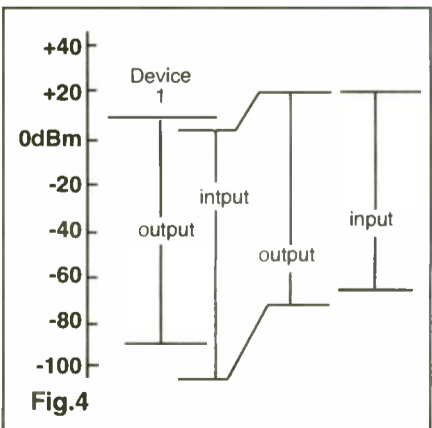


Fig. 4

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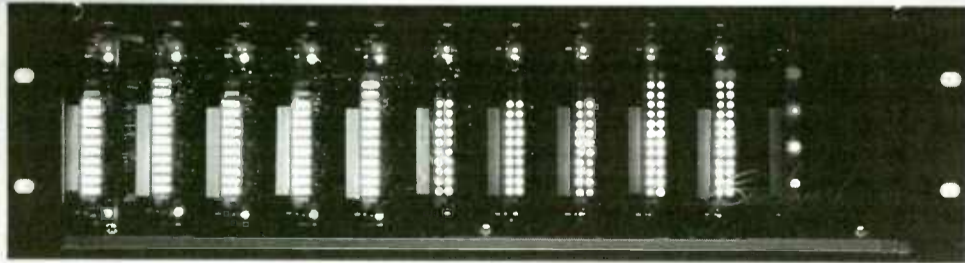
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# Hams Hunt for the Perfect Receiver

by Al Parker

**HICKSVILLE, N.Y.** "The stuff that dreams are made of." Isn't that a line from "The Maltese Falcon?" The good, bad and ugly all in desperate search of a metallic, jewel-encrusted dingus.

In amateur radio circles we have searchers just as determined, and metallic treasures just as desirable. I am such a collector of metallic beauty; encrusted not with jewels, but with glowing gem-like tubes.

It seems that many hams from all walks of life have the same affliction. Their treasure comes not by exotic tramp steamer but by more modern transport which still embodies all the same hopes, dreams and desires. There at curbside, in all its glory and majesty: the big brown truck!

## Sign here, Mr. Parker

Mercury, known to the unimaginative as "the driver," is standing at the threshold carrying a burden of some weight. All that separates me now from the moment of pure ecstasy is a signature. My hand shakes as I apply squiggles to the dotted line.

These days, the writing doesn't appear under the point of the pen, but on an LCD screen. The Etch-a-Sketch effect adds to the anticipation. I mumble, "Mystery guest, sign-in please!"

The young driver does not get it. He shakes his head as he walks away. I wrestle the heavy parcel to the dining room table.

## It seems that many hams from all walks of life have the same affliction.

The packaging flies in all directions. Packing-peanuts, bubble wrap and cardboard rain onto the floor like New Year's confetti. At the eye of the storm is a precious artifact. The quest is at an end, the real work has just begun.

This is no black-enamelled forgery. It's a real Hallicrafters SX-42 receiver.

To some, this is the most elegant general coverage receiver ever made. In 1948 it had eight watts of push-pull audio and covered the waterfront: the AM broadcast band, the FM broadcast band and everything in-between.

Not only was it an elegant hi-fi radio, it was also supremely competent as a communications receiver. A calibrated bandspread and superior crystal filter allowed it to fly with the eagles during the golden age of ham radio. It was to the usual receiver what the starship Enterprise is to Sputnik.

Prize in hand, I allow myself to think back to that Hamfest, the time an SX-42 slipped through my hands. Another amateur got the drop on me and ripped the precious cargo from my grasp. A chubby little speculator beat me to the punch. I hated to see the venerable creation of Bill Halligan's genius disappear into the gaping trunk of that philistine's Lincoln automobile.

I was desolate, but the memory of a lost love is mighty potent. I resolved to find the SX-42 again!

From that time on, my dreams were filled with semicircular green dials, art deco meters and massive, turret style tuning controls. The main tuning and concentric band-spread dials had a feel akin to precision bank vault tumblers. Once experienced it could never be forgotten.

I collected pinups of that baby. Soon my ham-shack was filled with images of the SX-42. My favorite was a shot of an Alpine radio station. The guy manning the remote shack was outfitted in full Tyrolean regalia including the leather

shorts. The SX-42 was the centerpiece of the array. That radio was so magnificent it even imparted credibility to a wacko in pointy shoes and a feathered hat.

## Misery shared

One night I sat at my Hallicrafters HT-37 transmitter, sipping the hard stuff — coffee, non-decaf. I shared my tragic story. Right out of the movies, it was "Set 'em up Joe ... I got a little story you ought to know."

The pathos poured into my microphone and across the wide open spaces. Propagation was good that night. My single 3-500Z was cutting a swath from the East Coast into the very breadbasket

of the nation. I had touched the hem of a goddess only to be cast down into the pit of despair.

The other boys at the radio bar had been there too. Their tastes were different to be sure, but they had all been smitten at one time or another with receivers that were beyond their reach. One guy in Virginia was hung-up on the classic Hammarlund SP-600, a New Englander on the Collins 75A-4.

An avant-garde type had a hankering for that top-of-the-line Icom R-9000 with the CRT spectrum analyzer. There were unusual proclivities as well. One kinky guy was knocking himself out to find a Lafayette HE-10! Weird, yes, but after all, love is blind.

Certainly, one could never have too many receivers. Cumulatively, we all had

continued on page 56 ▶

## WHY SETTLE FOR A FEW TOOLS WHEN YOU CAN HAVE THEM ALL?

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Any digital audio system is expected to provide immediate operating efficiencies and improve the bottom line. But systems are often selected without giving proper credit to the role as a platform for future capabilities and expansion.

Can the system adapt when you decide to change formats or automate overnights via satellite... or accept and delay more external feeds? What if you do your own in-house automation? Can it handle an LMA or duopoly, integrate a new station, maybe even simulcast with the present one? How flexible will it be for the new PD, or that hot morning jock... both of whom will likely have strong opinions on how to best utilize the system? Most digital audio products just don't adapt very easily, and you will most certainly be faced with additional software and/or hardware expenses for any changes... not with DAD.

DAD486x is the ultimate Master Toolchest for broadcast professionals. Your staff may not use all of the tools at first, but as proficiency is achieved, they'll come to apply them in more and better ways to improve your entire product. DAD doesn't dictate an operational structure.

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Circle (125) On Reader Service Card

World Radio History

# Hunting Down the Perfect Receiver

► continued from page 55

countless visits from the big brown truck. The sickness was the desire for even more.

As the hour got later we unashamedly shared our stories of the ones that got away. As the round table grew I realized that the world was full of people who had actually developed relationships with their receivers and fantasies about others not yet experienced.

It seemed that each of us were genetically matched to the characteristics, ergonomics and sound of specific radios. Each new addition to the shack got us closer to the "perfect" radio. One foolhardy soul risked being labeled politically incorrect by describing his radios as

"male" and "female." (No wisecracks about transceivers please.)

Anatomical allusions aside, I must agree on at least one level. Receivers are sensitive, sophisticated and beautiful. Their builders shape them, lovingly, with lavish industrial design and wonderful cosmetic touches. Receivers are smart extensions of consciousness, spirit guides to an invisible, electromagnetic world.

The Saturday after our Receivers Anonymous group, I was still down in the dumps about my lost SX-42. Just before lunch, the phone rang. It was an old friend from Michigan.

He had been listening the night before and felt compelled to lend a hand. He had an extra SX-42 and an R-42 speaker.

You have to understand the source of my utter joy. This is comparable to having an extra Mona Lisa lying around the house!

As luck would have it, I had a small transmitter he wanted. He swore that the swap was fair, but I suspect that he was taking a beating just to help me get over my tragic loss. Maybe he just got tired of hearing me whine.

That is how I came to possess my voluptuous SX-42. Unwrapped, it sits before me, looking quite the victim of benign neglect. Even so, the beauty shines beyond the ages and through layers of nicotine and dirt.

I plug in and listen for a pulse. A fuse goes.

### Emergency surgery

Right onto the operating bench it goes. It is never wise to operate on a loved one, but there is no choice; I am fighting against time.

If I fail to excise the faulty capacitors a "plate attack" might ensue. And once the plate transformer goes, it is all over. These old paper coupling and bypass caps are notorious.

I labor through the night and the next day. Finally it is done. I insert the stethoscope, er, headphones and plug it in.

At first, nothing. My bloodshot eyes are about to flood with tears of despair. Then I hear a pop. In back of the rig I see the clip lead to my antenna has slipped off.

I reattach it and spin the main tuning dial. Stations zoom by like utility poles past the window of a fast moving train. The heavy counterweighted knob slows and finally stops on some sort of ethereal chanting.

A beautiful female voice was raised in praise of something. I cannot understand French, but its haunting beauty sends a chill up my spine. It almost seems like the soul of the magnificent old radio joyously celebrating its own rebirth.

After a cosmetic make-over, the SX-42 is now happily married to my stolid Johnson Viking II CD. They make beautiful talk together.

Incidentally, that Viking came to me one clear, cold December night two years earlier. You see, this big brown truck pulled up in front of my house ... but that is another story.

Al Parker writes about photography and amateur radio. He can be reached at 516-681-6733.



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Circle (83) On Reader Service Card

## Do Things Differently And Stand Out in Radio

► continued from page 49

poorly scheduled special programs and remotes. Some of this can't be avoided, but most of it can be helped.

Morning show: If you've got a strong morning show, you should be running a "best of" show Saturdays from 10 a.m. to 2 p.m. or for at least part of that time. It's probably one of your most listened-to times of the week! Make sure those bits are short and well produced.

DJs: Would you be better off if a few of your full-timers worked Saturday and Sunday and took Monday or Tuesday off? Maybe. Look at your listening patterns.

Specialty shows: I'm a huge advo-

cate of specialty shows that bring in unique cume, but only if you use them at times when you really need the help. The shows should also add something to your image - coolness, depth, emotion or involvement with your listeners.

Getting the formatics of any radio station in place is easy. In fact, the formatics are what your listeners now expect. The challenge is delivering fun and creating memorable moments. Isn't it time you took a chance on something new?

Mark Lapidus is the director of marketing at Liberty Broadcasting. Reach him care of RW.

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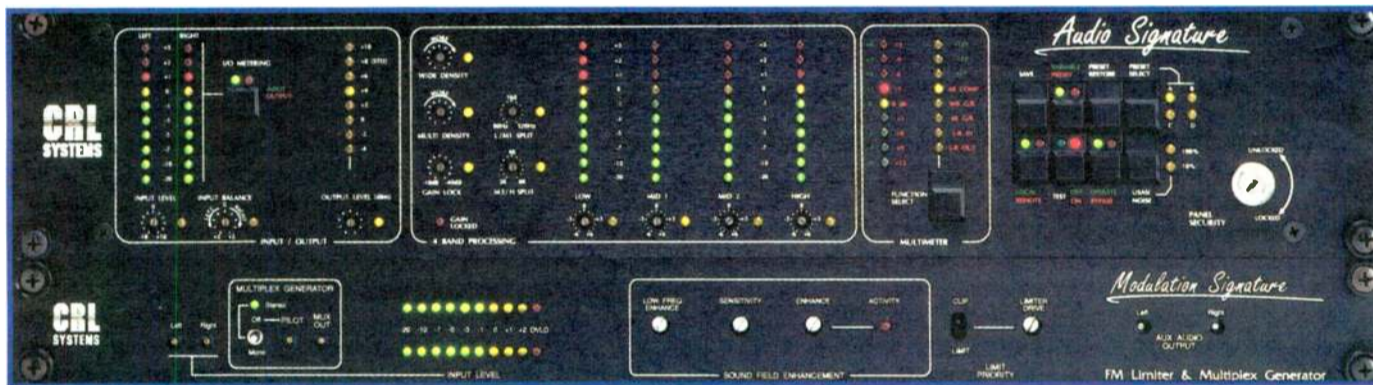


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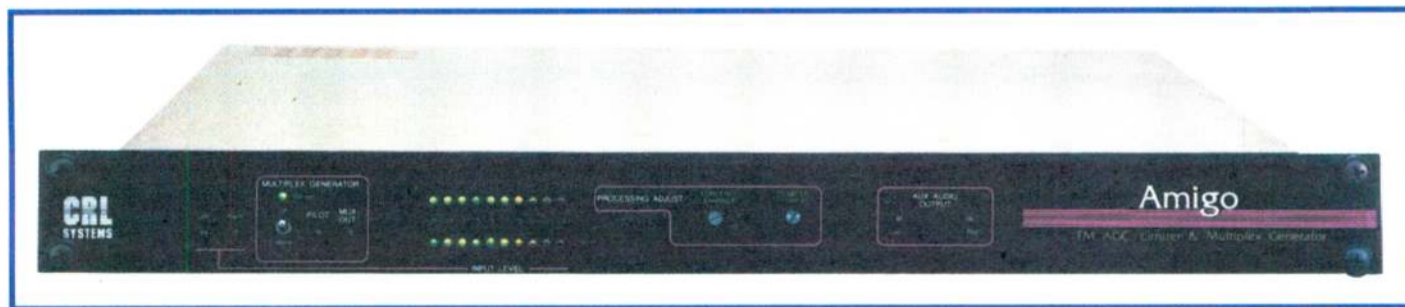
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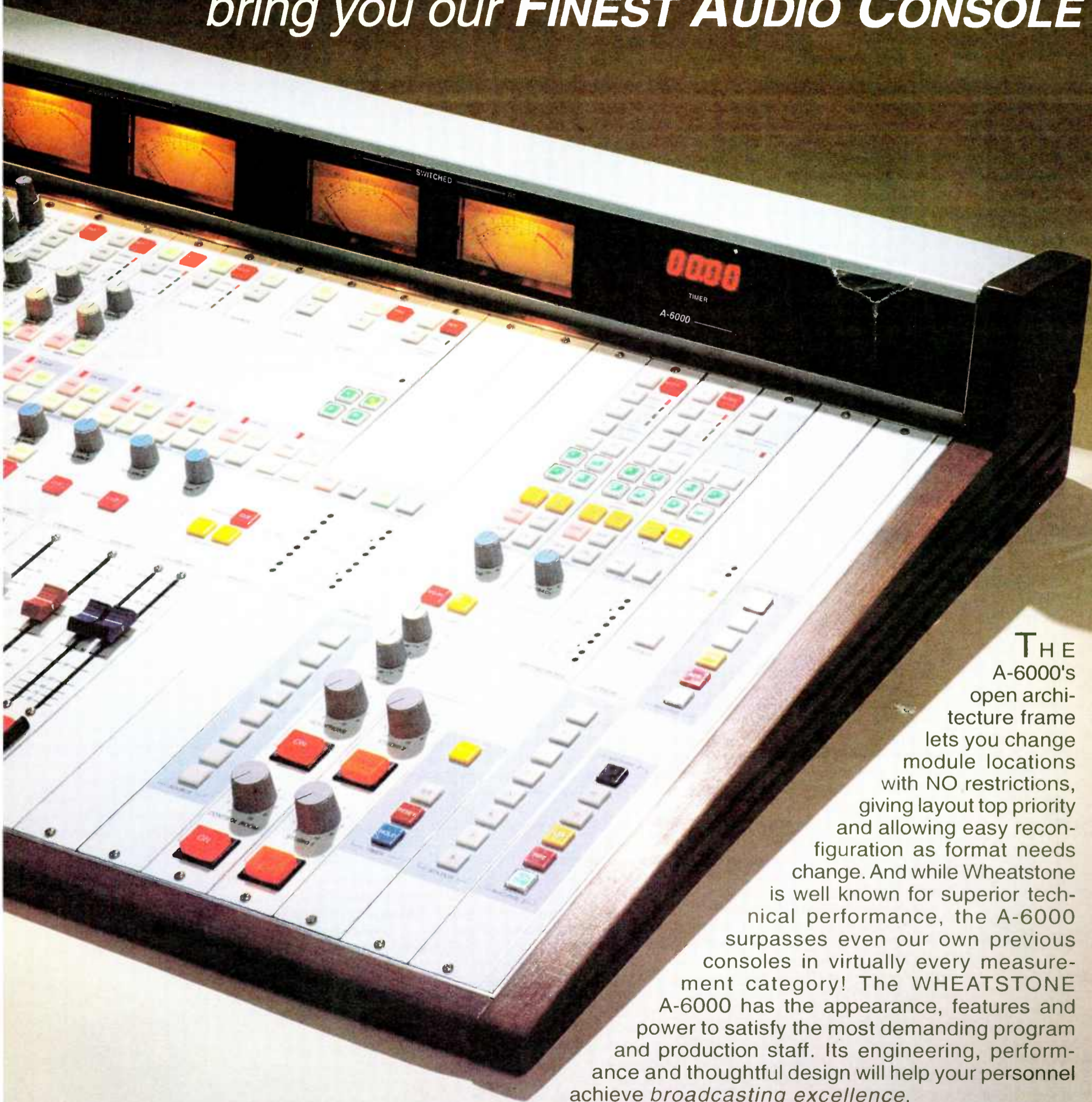
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