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# Radio World



Copyrights, Opera  
 And Internet Radio:  
**See Page 28**

Vol 21, No 1

Radio's Best Read Newspaper

January 8, 1997

## NAB Waits While IBOC Readied

by Lynn Meadows

**SAN FRANCISCO** With all in-band, on-channel digital audio broadcasting (DAB) systems withdrawn from the field tests in San Francisco, the National Association of Broadcasters (NAB) stands poised to facilitate new testing as soon as in-band, on-channel (IBOC) developers say they are ready.

What a difference a year makes. Last January, the radio industry waited while negotiators for the EIA and DAB proponents tried to reach an agreement on how to proceed with field testing. Now, still no closer to IBOC field tests, the industry is waiting for the best technical minds at USA Digital Radio/Westinghouse Wireless Solutions and AT&T/Lucent Technologies/Amati to say the enhancements to their systems are finished and

ready to test.

John Marino, director of technical conferences for the NAB, said the association has offered to help facilitate IBOC testing whenever USADR and AT&T give the go ahead.



"All they need to do is let us know," said Marino, and the NAB will either form a committee

itself for testing or work with the NRSC. The NAB ceased to play a role in the recently completed EIA field tests when the last IBOC system withdrew in September.

### History outline

DAB tests began in the NASA Lewis Research Center lab in Cleveland with seven systems: the Eureka-147 system, the S-band system developed by VOA/JPL,

one AM and two FM IBOC systems from USA Digital Radio, and an IBOC and IBAC (in-band, adjacent-channel) system from AT&T/Lucent Technologies and Amati Communications.

By the time the field tests finished in late October, only three systems remained in that process: VOA/JPL, Eureka-147 and the IBAC system from AT&T. USADR never reached an agreement with the EIA, instead electing to work on improving its systems rather than continuing with the field testing. AT&T pulled its IBOC system from the field tests last fall when it became clear that the frequency it had to use in the field was less than optimal.

Field test results for the three remaining systems were scheduled to be released to the NRSC and EIA subcommittees at the Winter Consumer Electronics Show in early January. The two committees involved in the testing process — the EIA/DAR subcommittee and the NRSC — will have the option to compile reports on

what the test results mean and make a recommendation to the FCC.

What happens next, said EIA spokeswoman Lisa Fasold, depends on how much the receiver manufacturers start pushing for digital radio. Fasold said the manufacturers need digital audio radio not only to launch new products but to

See NAB, page 6 ▶



**P**astor Rick Strawcutter calls his 95 W station the "Rosa Parks of radio." The FCC has other ideas.

See page 7.

## Super Effort Goes Into CBS NFL Coverage

by James Careless

**NEW YORK** The Super Bowl is the ultimate single-game test of sports broadcasting in America.

Certainly that's how Frank Murphy, vice president of programming for the CBS Radio Networks, sees it. "For a one-time only event, meaning a single game, it's the biggest event we do," he said.

CBS Radio Sports expects its Super Bowl XXXI show from the New Orleans Superdome on Jan. 26 to be its biggest broadcast yet, airing in at least 407 U.S. radio markets plus 400 Armed Forces Radio network stations worldwide. The total audience is expected to be nearly 14 million listeners, not bad considering that Fox TV is also carrying the game. Howard David will do play-by-play, Matt Millen will provide color, and Jim Hunter will host the pre-game and half-time shows.

Murphy said work begins on site in New Orleans a week before the broadcast.

"We fly our talent in on Sunday and Monday to begin work on the project," Murphy said. "Media Day is Tuesday, so they'll start gathering interviews at the ballpark with the players, and then we start assembling shows ... We have an

NFL Preview Show, which is a 15-minute show we do every week (on Fridays) during the season that has to be

See NFL, page 8 ▶



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## Country Music Comes Back To the City

by Lee Harris

**NEW YORK** New York City lost its only FM country outlet in February 1996. Now, for a fraction of the cost of buying an FM in the city, Odyssey Communications has returned the format to the area by tying together three class A FMs, all operating at 107.1 MHz.

"Y-107" is Odyssey's second "trimulcast" in a major metropolitan area. Last year it snapped up three class As in the Los Angeles area (also operating at 107.1 with the slogan Y-107) to cover that market with a modern rock format.

Odyssey already owned alternative rocker WRGX(FM), licensed to Briarcliff Manor, in Westchester County, north of New York City. Late last year it began negotiating for the other two stations necessary for the trimulcast: oldies format WZVU(FM) in Long Branch, on the New

See Y107, page 11 ▶

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World Radio History

# NEWSWATCH

## Westinghouse and Infinity Shareholders Bless Merger

**NEW YORK** Shareholders of Westinghouse Electric Corp. approved the company's merger with Infinity Broadcasting Corp. last month. In a separate meeting on the same day, Infinity shareholders also voted in favor of the merger.

The combined group would be a dominant force on the radio landscape, operating 79 stations in 17 markets.

The U.S. Justice Department approved the merger in November, after obtaining agreement that the new entity would spin off stations in Boston and Philadelphia.

The merger must still be approved by the FCC. At a Paine Webber media conference the next day, Westinghouse CEO Michael Jordan and Infinity CEO Mel Karmazin said that the new conglomerate would look towards acquiring radio stations in markets in which it has stand-alone TV stations.

The industrial and broadcasting divisions of Westinghouse split in November. A name of the new broadcasting/communications entity had not yet been settled.

## Arbitron Votes Are In

**NEW YORK** The Arbitron Radio Council has several new faces after

elections last month. This group ensures that Arbitron stays on top of what's going on in the radio world at large.

Ron Rogers, president and general manager of KVET-FM and KASE(FM) in Austin, Texas, will serve as the council's 1997 chairman. Five new members began serving three-year terms Jan. 1. They include Philip Redo of WLIT-FM Chicago, who represents the contemporary format; Oliver Sutton of WBSL(FM) New York, black/urban; Mike Gatons of KNUE(FM) Tyler, Texas, country; William Douglass of WYNF(FM) Sarasota-Bradenton, Fla., AOR; and Dick Taylor of WPG(AM) Atlantic City, N.J., news/talk. The latter two hold new

council seats for non-continuously measured markets.

## Georgia Station Burned by Vandals

**JESUP, Ga.** Vandals destroyed WLPT(FM), setting fire to its transmitter and an adjacent storage building. The Christian station is part of the not-for-profit Good News Network, which serves the coastal area of Georgia.

The station was back on the air a week later, thanks in part to the ingenuity of Good News President Clarence Barinowski, who utilized a "fish freezer"

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# California Law Opens Up Automobile Ads

by Bob Rusk

**SACRAMENTO, Calif.** The new year has brought new legislation that makes it easier for radio stations in California to air automobile lease advertisements. The state had lagged others in implementing federal rules pertaining to such ads.

State law that dictates the inclusion of detailed information about lease terms meant in the past that announcers had to talk so fast that listeners could not keep up with them. California, which leads the nation in the number of registered drivers, demands more disclosures in such ads than any other state.

But with the passage of AB 2344, a bill introduced by Assembly member Tom Woods, the rapid-fire stream of words in those ads has been extinguished.

## Uphill battle

The bill allows radio advertisers to purchase a newspaper ad or use a toll-free telephone number so that consumers can obtain much of the information and study the options before signing a car lease agreement. This mirrors federal legislation that was first spearheaded by the National Association of Broadcasters.

"Radio stations (had) been forced to try and squeeze 50 seconds of complicated disclosure wording into a 30-second spot," said Woods. "AB 2344 adopts the streamlined federal lease regulations now in effect throughout the rest of the country, but retains all of California's tough additional disclosure requirements."

The passage of the bill, which was to take effect Jan. 1, was a long time in coming for George Nicholaw, general manager of CBS station KNX(AM) Los Angeles. Nicholaw was among the broadcasters who successfully lobbied on Capitol Hill for changes.

What Nicholaw did not anticipate, however, was that getting the legislation on the books in California would require another battle.

"We had to start all over again," he said. "That was so disappointing." The

California Broadcasters Association (CBA) was instrumental in shepherding the bill through the Assembly.

"Several bills were introduced along the way," said Stan Statham, CBA executive director. "We finally found a bill that was not going to pass and amended it. It was complicated, but in the last nine months we got the job done."

Auto lease radio ads in California must include disclosures if they contain statements referring to: the amount of any payment; the number of payments; any capitalized cost reduction; any or no down payment; or any payment required at the inception of the lease.

The spot now must also refer to the toll-free phone number or written advertisement in a local publication of general circulation that the consumer can use to obtain additional disclosures.

If the advertiser chooses to use a toll-free phone number, that number must be active on the date of the first radio advertisement and continue until 10 days after the final ad has aired. If a newspaper is used, the notice must be published three days before the radio ad first airs and end 10 days after the final radio spot.

Required disclosures include: that the transaction advertised is a lease; the term of the lease in months; and a statement of whether the consumer has the option to purchase the vehicle and at what price and time.

In signing the bill, Governor Pete Wilson commented, "California has once again shown the rest of the nation we can remain competitive while maintaining first-class consumer protection standards."

The CBA expects radio stations throughout the state to start getting their share of lease ads from dealers.

"Now you'll hear more radio ads for lease cars in California," Statham said. "That money will go to radio stations, those stations have employees and they'll turn around and put that money into California's economy."

Seeing the three-year struggle come to a successful conclusion, Nicholaw said, "It's about time. Both radio and the automobile industry will benefit."

# NAB Crystals Honor Community Service

by Matt Spangler

**WASHINGTON** The National Association of Broadcasters (NAB) will bestow its prestigious Crystal Radio Awards upon 10 radio stations at NAB '97. The awards honor stations for exceptional service within their communities during the previous year.

The winners will receive their awards at the convention's Radio Luncheon, to be held on Tuesday, April 8. Winners are selected by an independent panel of judges rounded up from both the radio and the community service fields.

This year marks the 10th anniversary of the awards. NAB President and CEO Edward O. Fritts said the Crystals "reward stations for their outstanding community involvement and help us to promote radio's exemplary community service to those on Capitol Hill and at the FCC."

Members of Congress have in the past sent letters of commendation to winners of the award.

Previous winners have heralded the exposure the award gave them. 1995 winner Bob Gourley, general manager of KKCS-FM in Colorado Springs, Colo., said the award "is the ultimate confirmation that our station is the unrivaled market leader."

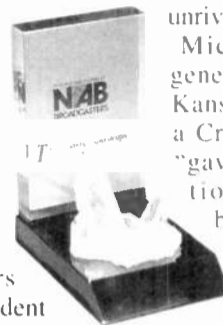
Michael Carter, president and general manager of KPRS(FM) in Kansas City, Mo., which also won a Crystal in 1995, said the award "gave the sales department additional 'ammo' to reach new business."

Others characterized winning the award as more of a philanthropic endeavor.

"If broadcasters strive first to serve their community, ratings and revenue will follow," said 1993 and 1995 winner Mark Steinmetz, president and general manager of KQRS-AM-FM in Minneapolis.

The NAB is accepting entries for the awards through Feb. 3. The entry fee is \$50 for NAB members and \$100 for non-members.

For information on how to enter, contact B.J. Cohen-Corriveau in the NAB Radio Department at (202) 775-3510.



## NEWSWATCH

► NEWSWATCH, continued from page 2

to temporarily store equipment while a new building was constructed.

An official with the local fire department said the incident was under investigation and that there were no suspects in the case. Barinowski said the fire was considered a random act by juveniles. The ATF is conducting a separate investigation into the incident because the facilities housed equipment for the bureau.

The station had just completed new facilities a year ago.

### WVBA and MAB Hold Meetings

Radio managers in West Virginia and Michigan will gather in the coming weeks.

The West Virginia Broadcasters Association Winter Meeting will be held at the Marriott Town Center in Charleston, W. Va., on Jan. 26 and 27.

Approximately 175 general managers, engineers and programmers are expected to attend.

For information, call (304) 744-2143, or fax (304) 774-1764.

The Michigan Association of Broadcasters holds its annual Great Lakes Broadcasting Conference and Expo in Lansing, Mich.

The conference will take place at the Lansing Center on Feb. 25 and 26. The theme of this year's show, the largest such state association event in the country, is "Re-Engineering the Broadcast Industry."

More than 1,000 attendees are expected. Organizers have invited more than 30 speakers including FCC Commissioner Susan Ness.

For information about registration, conference sponsorship or exhibiting, call (800) YOURMAB or send e-mail to [michmab@aol.com](mailto:michmab@aol.com).

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# Harris Expo Draws Quality Crowd

**RICHMOND, Ind.** Neither snow nor cold nor the onset of bronchitis could keep me from my annual trek to the Harris Broadcast Expo. Held every year in early December, the free exposition of production and engineering technology was housed Dec. 5-6, 1996, at the Clarion Leland Hotel here.

Things actually got going on Wednesday, Dec. 4, 1996, with a welcoming reception. The exhibit floor opened at 9:30 on Thursday, with early bird attendees privy to the technical session, "Digital Connectivity" at 7:30 a.m. Thursday events culminated with another technical session, "Nuts and Bolts," in the evening.

Friday morning attendees were treated to words of experience and wisdom from small market expert and publisher, Bob Doll. Once again the exhibit floor opened at 9:30 a.m. and stayed open until 3 p.m.

Exhibitors love this two-day expo, as it provides them a chance to visit with broadcasters in a timely and relaxed environment.

Among the exhibitors present was Intraplex. Showcasing its high-speed digital communications equipment, the company display included the Intraplex STL Plus System — designed to transmit 16-bit linear stereo audio over T1 lines with no digital compression, making it a good choice for situations where compression may occur at other stages of the audio chain.

Comrex showcased the HotLine, a product that delivers high-quality audio over ordinary dial-up telephone lines (POTS). It is ideal for live remotes, news reports or other audio feeds in locations where ISDN is not available.

Two HotLines are required for operation, one at each end of the line. The transmitted bandwidth corresponds to the data rate, producing 4.5 kHz to 10 kHz audio at data rates ranging from 12 kbps to 33.6 kbps.

The company also displayed its established line of ISDN products.

GEPCO International unveiled the 4200 series multipair cable with color-coded jackets. It also displayed audio

cable, including single-pair, multipair, multiconductor, speaker, guitar/instrument, mic, digital audio and fiber optic.

Orban enthusiasts were treated to hands-on demonstrations of the DSE-7000 FX digital sound editor upgrade including EQ, reverb and compression. The company had its OPTIMOD 2200 on display as well as its OPTIMOD 8200 digital audio processor. The recent acquisition of DDS (Digital Delivery System) of which the company began production of in October at its California facility, was also on display.

The DDS product line combines a user-friendly "analog" feel with an efficient QNX-based multi-user and multi-tasking operator system. It is compatible with popular traffic systems, making pro-



The Clarion Leland hosted the Expo crowd, with crowd pleasers like Bob Doll (l), and Dave Burns.



gram log importing an easy task. The system supports MPEG Layer 2 audio and multiple sample rates, and can be expanded as station needs grow.

Symetrix exhibited its 528e voice

processor, its 628 digital voice processor featuring programmable presets, its 422 AGC/leveler and its 610 broadcast profanity delay.

360 Systems had its Shortcut stereo digital audio editor on hand. Designed for editing call-ins, news reports and voice-overs, the self-contained unit includes a backlit LCD waveform display. The company also displayed its Instant Replay hard disk audio player.

Marti Electronics came to the show with The Smarti remote telephone broadcast system. This device won the 1996 RW "Cool Stuff" award at the spring NAB show in Las Vegas.

The Smarti is a telephone remote pickup system capable of sending and receiving 7.5 kHz audio over a single standard POTS line. The unit has a built-in four-input mixer for line and mic signals, headphone jacks that allow a mix of program and return levels for the remote talent and a self-contained telephone dialer and interface.

The folks at Arrakis displayed the new digital workstation, Digilink 4. The unit fits in the space normally occupied by cart decks in a studio, and in some cases is even compatible with the cables. It occupies two rack units, and incorporates three players and one recorder.

Digilink 4 uses MPEG Layer 2 compression to store a minimum of 12 hours of audio, expandable to many more, and the user can tie up to 48 studios together for powerful, flexible audio management. An optional jingle box puts a control surface in a desktop or in an Arrakis console.

AEQ displayed its BC-300 broadcast mixing console.

Cutting Edge Technologies was on hand, displaying its line of Unity on air processors for AM and FM, and its Dividend composite filter. And for those of you who have heard the rumors that something new and digital is simmering in Frank Foti's kitchen, you've heard right. Watch for more news to come from Cleveland in the near future.



Telos Systems demonstrated the new, portable version of its popular Zephyr digital codec, called ZephyrExpress, which includes an ISDN terminal adapter and an audio mixing/monitoring system in a rugged chassis. The company also now offers talk show management software for Windows, in addition to its established line of codec products.

MUSICAM USA displayed the company's newest products: the prototypical Olympian console-style codec/mixer and RoadRunner portable compact codec/mixer.

The RoadRunner provides 15 kHz mono audio on an ISDN "B" channel or 20 kHz on a full ISDN line. The unit can activate far-end relays with four contact closure buttons. A three-input mixer handles two mics and one mic/line-selectable input.

On hand also were the company's established line of codec products.

■ ■ ■

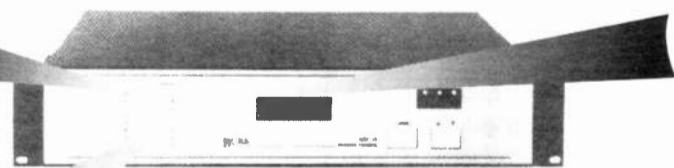
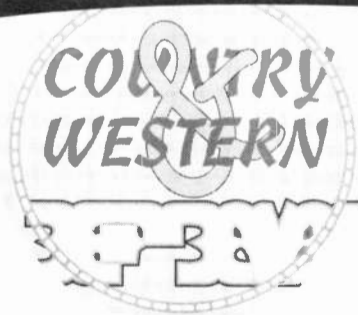
While in Richmond, I also had the chance to visit with Joe Zeimer of Broadcast Richmond. The company just celebrated one year in its brand new headquarters, and Joe tells me it's doing quite well with its distribution/export



Joe Zeimer's place is in Richmond, Ind.

business.

Well, that's my report for now. Till next time!



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### Radio must support RDS

Dear RW,

I would like to offer a comment on RDS. I am a salesperson in a consumer electronics store. I also have been involved in broadcasting (engineering and programming consulting) since 1987. None of the twelve FM stations in my market have installed RDS encoders, but we can receive stations from New Orleans and Pensacola that do have them.

After purchasing and installing a Denon RDS-equipped car stereo in my car, I was disappointed to discover that three of the four stations with an RDS signal sent inaccurate information. A fax to each of the stations quickly corrected the situation, except for WÖWW(FM) Pensacola, Fla. They have an incorrect station name and their clock time is two hours fast. If my experience is indicative of other markets, there could be many stations nationwide who purchase, install, and program RDS encoders and then forget about them.

If used properly and actively promoted, RDS can be a powerful marketing tool for FM broadcasters. Unfortunately, it is difficult to sell RDS radios when no local stations send the signal. It would have been great if RDS alert capability was made a part of the new EAS protocol. Then the replacement of the EBS systems would have made RDS standard equipment on all FM stations, and the RDS alert-equipped radios would not have had to be on to receive the alert message.

Kevin Wooldridge

Hooper's Stereo-Video-Computers  
Gulfport, MS

### Fighting Uncle Sam

Dear RW,

Helixing is a manufacturing concern of antennas, principally medium wave, but also long and short wave, for the commercial market, the amateur and the hobbyist.

In October of 1993, I requested and was granted a "Special Temporary Authority" for transmissions in the AM broadcast band, from the Federal Communications Commission. I believe I needed this license, this "tool" to conduct tests. Sporadically over the years, you, RW and I have sold a few antennas. I had become interested in resurrecting the antenna manufacturing business, and starting another round of testing and advertising. I requested a second license in February of '96.

But much to my surprise and dismay, my second request for an identical license from the FCC was met with incredible amounts of resistance, red tape and ultimately, rejection. I supplied the FCC with the amendments that they required only to withhold information when it got to the point of disclosing trade secrets about MW vertical antennas with gain or wide bandwidth or shielded transmitting antennas. I was nearly accused of causing interference even before a single antenna was excited. I do not have at my disposal the funds available to hire a team of lawyers to confront the FCC. I write to you today in hopes that some other fledgling company will encounter more amiable results in a government that is supposed to serve the people.

Frank P. Patka  
Helixing Inc.  
Lockport, IL

### Fair fees

Dear RW,

While the FCC's regulatory fees have shown somewhat of an effort of equitability relative to the size of broadcast stations, the Montana Broadcasters group has made an alternate suggestion. That suggestion changes things around a bit; it helps them and other small market stations, but its fairness to all broadcasters is also questionable.

Seems to me, the *only* truly equitable way to collect regulatory fees (if it must be done) is to either give each station

## Time for Radio's Makeover

It is time to reinvent radio's image in the media marketplace.

Obviously, if you are a fan of the "If it ain't broke, don't fix it" school of thought, you can stop reading right here. But if you are anxiously watching the industry contract and metamorphize, you already should be thinking about your role in that future radio scenario.

Broadcasters pushed for the deregulation of radio station ownership. Efficiencies of scale, they claimed, and they were right. But already radio stations face a crowded playing field with cable, over-the-air television, videos, Internet, print, billboards, etc., clamoring for advertisers' budgets. Advertisers are looking for targeted media vehicles that can deliver their audience.

Radio has been that vehicle for a long time, but General Motors cannot track down 2,000 radio sales managers and make 2,000 spot buys for its 20-plus brands. Radio is now, however, in a position to approach General Motors or American Airlines or Kmart and present targeted media packages for defined audiences. Why? Because the mega-mergers and market consolidation have facilitated that kind of radio structure.

In the same way that radio groups are now consolidating their purchasing power to exploit their internal efficiencies of scale, these same groups can set up staff whose job it would be to attract substantial new advertisers to radio — in a big way.

There may be fewer radio owners in the medium's near-future, particularly in larger markets, but the opportunities to help grow the business are growing exponentially.

Improving radio's image in today's crowded media marketplace can only help all of us. Imagine if instead of 7 percent of all media budgets, radio received 8 percent? The impact would be monumental. The achievement is certainly attainable.

Polish your image by demonstrating just how effective radio already is. Then hold on for the growth. —RW

50,000 W (get my point?) or better yet, charge each station an amount based upon what it momentarily earns from its service area.

The only way to fairly charge regulatory fees is to do it the same way ASCAP and BMI charge their fees. A same one percentage for all, based on each station's gross billing. Simple as that!

Stations involved in LMAs, JSAs and QPKs can file joint reports and fees. All other spectrum users would file reports, too. This plan would also include (gasp) so-called non-commercial stations. Those non-coms that have incomes would pay just like the rest of us: those who don't, wouldn't. Independently owned translators with no income would not pay. Translators used to solicit incomes or air advertising would pay.

In any case, *all* stations and spectrum users would file a yearly report similar to that of ASCAP/BMI or a tax return and staple a check to the bottom third of the page.

Bob Bittner, Owner  
WJIB(AM) Cambridge, MA  
WNEB(AM) Worcester, MA

### In poor taste

Dear RW,

I am compelled to comment about a photograph on the cover of the Nov. 27 issue of RW. To have printed a photograph of the fellow shown firing an automatic weapon is in about as poor taste as it gets and has nothing to do with the content of the article, except perhaps to illustrate a childishness in the life of the featured individual and in the mind set of

the person who decided to put that photograph there. Does this characterize the mentality of the wave of the future of commercial radio?

If Mr. Tracht engages in shooting automatic weapons as a hobby, that is certainly his right and his business. There are lots of people in this world who engage in personally entertaining activities, the knowledge of which I (and I suspect you too) can be quite happy without.

Firearms are designed for one purpose: killing living things. I was raised using rifles and shotguns to hunt wild game. These were not automatic weapons. In the Army they taught us about using automatic firearms to kill other people. This is the only thing automatic firearms were designed for. Although I saw time in Viet Nam, I was luckily never called on to kill other people face to face. I have good friends who were not so lucky and saw many of their buddies die and were put in the position where they had no choice but to kill other people. It is not a light-hearted choice. You leave some of your soul behind when you do these things. They are still trying to recover from that episode in their lives.

So for a professional trade journal to represent an activity which means nothing more to me and I suspect many combat veterans, than physical and spiritual death, is disappointing and at the very least in extremely poor taste.

I have always enjoyed RW for the technically informative articles and will continue to do so. Thanks for your time.

Lewis Downey, Engineer  
KUER(FM)  
Salt Lake City

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Next Issue of Radio World  
January 22, 1997

# NAB Ready to Roll

► NAB, continued from page 1

satisfy a consumer demand for digital.

She pointed out that, in CEMA's estimation, analog is fast disappearing and digital is surfacing in many entertainment media: music (CD), video (DVD) and even television (HDTV). She says radio will soon be the only analog medium left and consumers will, again in CEMA's estimation, want it to be digital as well.

## Eureka in Europe

In other countries, consumers are getting digital radio because broadcasters are using the Eureka-147 L-band system developed in Europe. In Toronto, for instance, major radio broadcasters plan to launch digital simulcasts of their AM/FM signals starting in 1997 using Eureka.

In this country, however, Eureka faces an uphill battle whether or not it has the support of receiver manufacturers. The NAB originally embraced the idea of the Eureka system before broadcaster opposition forced the association to back down.

Why? First, the Eureka system as tested uses the L-band, which the U.S. government and commercial industry keep for aeronautical telemetry, among other things. If the FCC and the National Telecommunications Information Administration actually agreed to let broadcasters have the L-band for DAB, the big question in the age of spectrum auctions is, "What would it cost?"

Second, critics initially said the Eureka system would force all broadcasters who shared one of the system's single-frequency networks also to share the same coverage area. Recently, Delco Electronics has been supporting a Eureka-developed solution, TDMA, a time division solution still in the theoretical stages, as a way to allow broadcasters to use Eureka and still maintain their current coverage areas.

Enter the uniquely American idea of an IBOC system. This idea, developed into working systems by both USA Digital Radio and AT&T/Lucent Technologies/Amati, does not suffer from

this perceived drawback; the digital signal can share the FM analog frequency while maintaining essentially the same coverage area.

But the IBOC systems did not fare well in the lab tests. USADR, in fact, clashed with EIA and accused it of performing the tests improperly. EIA replied that USADR was not facing the reality that its systems had problems.

## Heated exchange

USADR is now facing those problems with the help of Westinghouse Wireless Solutions. At the Society of Broadcast

## What happens next depends on how much receiver manufacturers start pushing for digital radio.

Engineers annual conference this fall, Brian Kroeger of Westinghouse Wireless provided attendees with a list of improvements the Deskin Research Group had recommended for the USADR IBOC systems (RW, Oct. 30).

According to Kroeger, Deskin found that the USADR digital system interfered with the host FM signal. The group also discovered problems with first and second adjacent-channel interference and multipath. Kroeger announced that solutions were being sought for these problems.

USADR President and CEO Bernee Strom said late last month that the company will demonstrate its system in early 1998.

After Kroeger's presentation, EIA's Gary Shapiro wrote in a letter to the *RW Readers Forum*, "So, they finally admitted it! After accusing us of all sorts of sins,

including bad testing and unfairness, USADR now issues an independent report which substantiates our test results."

He stated that the Deskin findings matched those found in the 1995 CEMA lab tests. "USADR consistently claimed its system worked fine and that our process was flawed," wrote Shapiro. "However, we committed to fair and impartial testing and that is what we provided."

USADR received a renewed commitment from Westinghouse to pursue its IBOC technology. With the NAB ready to take on the role of facilitator, the EIA lab tests results can only help AT&T and USADR make improvements to their systems.

Marino noted that when the proponents finally say they are ready for the NAB, the new round of testing will probably have to start from "ground zero" because the systems will have changed so much. That means testers will have to repeat the lab tests in addition to performing new field tests. Marino was optimistic, however, that any new DAB testing could be done faster as much had been learned from the DAB testing process to date.

Other countries are also pursuing DAB. The first DAB single-frequency network (SFN) went on air for testing and demon-

stration in China last month. The SFN consists of three transmitting stations situated in three cities (Guangzhou, Foshan and Zhongshan) of the Guangdong province adjacent to Hong Kong. This is the first SFN in the Asia-Pacific area, according to Mr. He Dongcai, vice minister of radio, film and TV.

China and the European Commission (EC) cooperated on the project. The ISO/MPEG Layer 2 encoder and COFDM modulator were provided by the EC and the DAB power amplifiers for the transmitting sites were developed by a Chinese manufacturer.

In Mexico, the government and broadcasters have jointly established the Permanent Digital Audio Broadcasting Commission with the aim of leading the introduction of DAB in Mexico over the next few years. Although Mexico has not yet selected a DAB standard, the commission is chartered with planning the development of the commercial, technical, financial and regulatory facets of the technology.

The group will chart two courses: one for the implementation of a European-supported Eureka-147 system on the L-band and one for the implementation of a U.S.-supported in-band solution (be it an on-channel or adjacent-channel solution).

## BUSINESS DIGEST

Report business news to: Radio World  
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### PR & E launches web site:

Broadcast studio equipment manufacturer Pacific Research & Engineering announced the launch of its site on the World Wide Web for clients, prospective customers and investors seeking product and company information via the Internet.

The Web site (<http://www.pre.com>) provides customers and investors with details on the company's 27-year history, product descriptions, the company's recent public offering, links to request investor information, new product developments and more.

In addition, the site features "Tech Tips," monthly articles written by broadcasting engineers from across the country.

"The tips are written for general consumption by the broadcasting public," said chief operating officer Michael Dosch. "The articles supply broadcasters with valuable maintenance and technical tips for application on all types of production and broadcasting equipment in an array of studio settings."

### Wegener increases revenue:

Wegener Corp. announced improved results for the fiscal year that ended Aug. 30, 1996.

Revenues for fiscal 1996 rose to \$23.2 million, up 19 percent compared to revenues of \$19.5 million for the year ending Sept. 1, 1995. Operating results for fiscal 1996 improved, with net earnings reaching \$1.45 million or \$0.16 per share, compared to \$385,000, or \$0.05 per share, recorded for the year ending Sept. 1, 1995.

Record quarterly revenues of \$8.05 million were posted for the fourth fiscal quarter ended Aug. 30, 1996, up 20.5 percent, compared to revenues of

\$6.08 million for the final three months of fiscal 1995. Net income for the fiscal 1996 fourth quarter was \$1.02 million or \$0.11 per share, compared to \$410,000, or \$0.05 per share, for the three months ending Sept. 1, 1995.

### Regent closes on Utah stations:

Regent Communications Inc. closed on its purchase of radio stations KUTQ(FM) and KZHT(FM) in the Salt Lake City market for \$11 million cash.

KUTQ and KZHT are owned by Starley Bush, et. al. and Bountiful Broadcasting II, LLC, of which Bush is managing partner. Regent Communications currently owns KKAT(FM), KODJ and KALL-AM-FM, all of which are in the Salt Lake City market.

KZHT-FM broadcasts on 94.9 MHz with 47 kW at HAAT of 2,790 feet and KUTQ broadcasts on 99.5 MHz with 39 kW at HAAT of 2,953 feet.

### New York boom in ad sales:

New York market radio stations increased their advertising revenue by 18.6 percent in October 1996, vs. October of 1995.

This is the largest percentage increase of any month in 1996 and represents the fourth consecutive month of double-digit sales gains.

Total sales for the month were \$45.4 million, compared to \$38.2 million in October 1995. Local sales rose 19.2 percent to \$36.5 million, while national business was up 6.6 percent to \$8.1 million.

The revenue figures are based on the New York Market Revenue Report prepared for New York Market Radio (NYMRAD) by Miller, Kaplan, Arase & Co., CPAs.

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# 'Peanut Powered' And Making Waves

by Sharon Rae

**ADRIAN, Mich.** This sleepy Lenawee County town has come alive with controversy over a new unlicensed low-power radio station that's up and running in the county seat. Pastor Rick Strawcutter has preached to his congregation at the Church of the Lord Jesus Christ for two decades, and now he has taken his message to the airwaves.

Strawcutter calls Radio Free Lenawee "free speech with no sacred cows" and

"absolutely constitutional and lawful," and also said some of his legal basis is from a California federal court case involving Stephen Dumifer, a broadcast engineer who runs a low-power station called Free Radio Berkeley (RW, Aug. 21, 1996).

"The court essentially ruled that the FCC's current ban on low-power broadcasting — that is anything below 100 W — is not the least restrictive means," said Strawcutter.

See STRAWCUTTER, page 13 ▶



Pastor Rick Strawcutter at Radio Free Lenawee

Radio Free Lenawee  
**97.7 fm**  
**GOD, GUNS & GUTS**  
**MADE AMERICA**  
**LET'S KEEP**  
**—ALL THREE—**

the "Rosa Parks of radio." He addresses a broad range of topics, from what's on the front page of USA Today to the latest CNN news stories, all with a religious bent. The pastor broadcasts his programming from the church offices, which he leases.

"We apply our Christian viewpoint to everything that's going on in the world ... whatever is newsworthy," he said.

Strawcutter's message deals with anti-government themes, the New World Order and government conspiracy theories. His station's conservative outlook is getting attention locally and has been the subject of a prominent article in the Detroit News.

The very existence of the 95 W station has caught the attention of the Federal Communications Commission.

## Shutting out the FCC

Eighteen days after the station came on, the FCC paid a visit to the station in hopes of inspecting the studios. Their representatives were handed a paperwork package put together by Strawcutter's attorneys, Constitutional Litigation Associates of Detroit, and turned away by Strawcutter, who said the representatives were unable to cite their authority for coming to inspect the facilities.

"They don't have the authority to inspect an unlicensed station," he said.

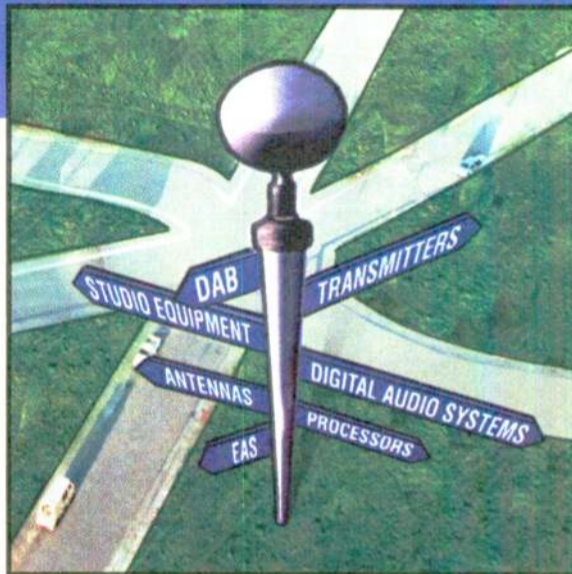
John Winston, an FCC spokesman, said the case of Radio Free Lenawee remains under investigation and will be thoroughly investigated.

"Operating a radio station without a license obtained through proper procedures required by the FCC can result in a fine of up to \$10,000 and confiscation of all equipment being used to broadcast," Winston said. He refused to discuss the case further.

Pastor Strawcutter said he's not a pirate.

"A 'pirate' infers you are doing something wrong," said Strawcutter, who maintained that what he is doing is

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# Super Bowl Strategy at CBS Radio

► NFL, continued from page 1

(produced) on Wednesday and Thursday. We'll also start assembling pieces of the Pre-game Show, which is an extended show for the Super Bowl."

CBS Radio Sports will also supply



Sports Commentator Howard David

what Murphy calls "alternative coverage," for FM stations and outlets looking for a different angle on the game. Anchored by nationally known fitness expert Bonnie Kaye, these reports will feature MTV-style coverage: "Who are the celebs in town, what's going on with the night life, what are the athletes doing when they're not competing ... background on athletes you normally wouldn't get on a standard dry sports report," Murphy said.

Then there's Game Day itself. Murphy said that, in addition to everything else, "You've got the added impediments of getting to the stadium much earlier than you normally would, because of security situations."

CBS Radio Sports will anchor its coverage from a press box in the Superdome alongside Fox Sports. In addition to David, Millen and Hunter, the broadcast team will include two technicians "because of the amount of work involved

and because of the importance of the game," plus a spotter and a statistics keeper. The game itself will be produced by Bill Ceverha, who handles Monday night football broadcasts for CBS Radio Sports. Howard Deneroff will produce the pre-game and half-time shows.

"As we get to half-time, we'll have an associate producer who will be going out probably early- to mid-second quarter, gathering the guests for the half-time show," he said. "That has to be coordinated with the NFL, so they know that we need access for these people, because that whole press row is a secured area."

"I'll be there too," said Murphy. "I usually handle the 'red phone', which is the ring-down phone to the NFL where we get all the injury reports, records and important stats as the game happens."

CBS will use Shure and Mackie mixers to manage its audio. The feed is back-hauled to New York without audio delay on ISDN lines, using CCS/Musicam USA Prima codecs. A two-line Comrex frequency extender provides a back-up feed.

Interestingly, although the network will insert commercials in New York, other pre-recorded audio elements will originate on location from portable Sony MZ-R3 MiniDisc player/recorders. "We've had great success with the MiniDisc over the last couple of years," Murphy said. "You can actually edit a pregame show on a MiniDisc if you know what you're doing." CBS also used the machines during its World Series coverage.

This setup will take CBS through the Super Bowl itself. Then, once the game is over, "the trophy presentation will be on the field, so we have to go live to that. We'll be using wireless technology on the field to get interviews, and we'll also be wiring up both clubhouses, to get interviews ... after the game. So, from a technical point of view, it's more complicated than a normal broadcast, because

normally we wouldn't wire clubhouses, and normally we wouldn't use wireless." Samson wireless mics handle this task.

"Of course, you've got to coordinate the wireless frequencies" with other users, said Murphy, remembering a disaster that nearly occurred in 1988.

"We were up in the booth beforehand, and Brent Musburger was doing our pre-game and half-time at the time," he recalls. "I was standing next to Brent about 45 minutes before game time, and we had not gone on the air yet."

"Brent's got his headphones on, and he looks at me with this funny look on his face. I say, 'What's the matter?' And he goes, 'I don't know, but I think I can hear Sam Wyche (head coach of the Bengals) praying.' And I say, 'You can't; they're not even on the field.'"

"But sure enough, NFL Films had gotten Sam Wyche to agree to wear a wireless microphone. It was a last-minute thing, and they just gave him the microphone, and didn't check the frequency, and it happened to be on the same frequency as the wireless microphone where our talent was. So we indeed were hearing Sam Wyche leading the team in a prayer underneath the stadium prior to the game."

## To the shower

Even today, the specter of wireless frequency screwups haunt Frank Murphy.

"My biggest fear is that one of our guys gets on the wireless and I hear him on the P.A. system in the stadium," he said with a laugh.

The CBS staff must take special precautions in the clubhouses, too.

"We keep the equipment in a large plastic bag before we get down there, because in many cases ... we will get to the locker room and they'll take us and the rest of the press that have access, put us in the shower while the team has their team prayer — generally after the game most of the teams will have a team prayer — and then the champagne gets uncorked

and we're able to come in. We then take the plastic bag off the equipment, and try to keep it as dry as possible."

He said, "You always bring your worst clothes when you have that assignment," simply because the biggest risk to the equipment isn't the showers but the winning players, whooping it up after the game.

When asked what part of Super Bowl planning provides his biggest challenge, Frank Murphy points not to the game, but the hoopla surrounding it.

"There are a lot of events that we have to deal with during the week — client presentations, dinners, lunches, that kind of thing — that we have to work into the schedule."

"We have to get all these other duties out of the way ... but just staying focused on the game is the most important thing we have to do."

## LARCAN-TTC Sales Manager Binsfeld Dies

**DENVER** John Binsfeld died Dec. 1, 1996. He was 47. The international sales manager for LARCAN-TTC, Binsfeld was also one of the longest living heart transplant recipients in the country.

"He was one of the best broadcast equipment salesmen in the industry — bar none," said Bill Harland, product line manager of broadcast products for Andrew Corp. Harland met Binsfeld when the two worked for Television Technology (TTC) in the early 1980s.

Binsfeld was chief engineer for Biederman Broadcasting in Michigan prior to taking the job at TTC in Denver. He started in the test department, then moved into engineering and finally sales. A few years later, he went to work for Broadcast Technical Services in New Orleans, where he worked on a variety of applications overseas. He later worked for CCA and Southern Coastal Marketing Service (SMCS) before returning to LARCAN-TTC in the early 1990s.

Binsfeld received the heart of a 19-year-old track athlete 10 years ago. His first heart failed the day after he arrived in New Orleans to start at Broadcast Technical, recalled Ken Devine, managing director for engineering and broadcast operations at WNET in New York. Devine worked with Binsfeld both at TTC and at Broadcast Technical. Binsfeld returned to work six months after doctors performed the heart transplant.

"He was very, very resilient," said Devine.

Binsfeld, whose mother is the lieutenant governor of Michigan, helped build radio and television facilities all over Central and South America. He also did work in Asia and had planned to travel there the week he died.

"He was genuinely a wonderful human being and we loved him and we miss him," said Devine.

"He led a really full life," said Harland.

— Lynn Meadows

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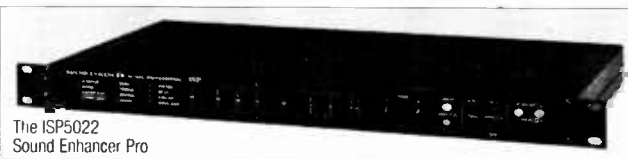
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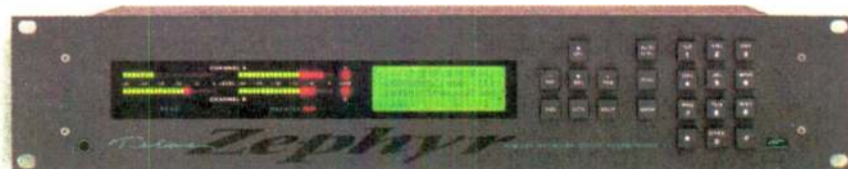
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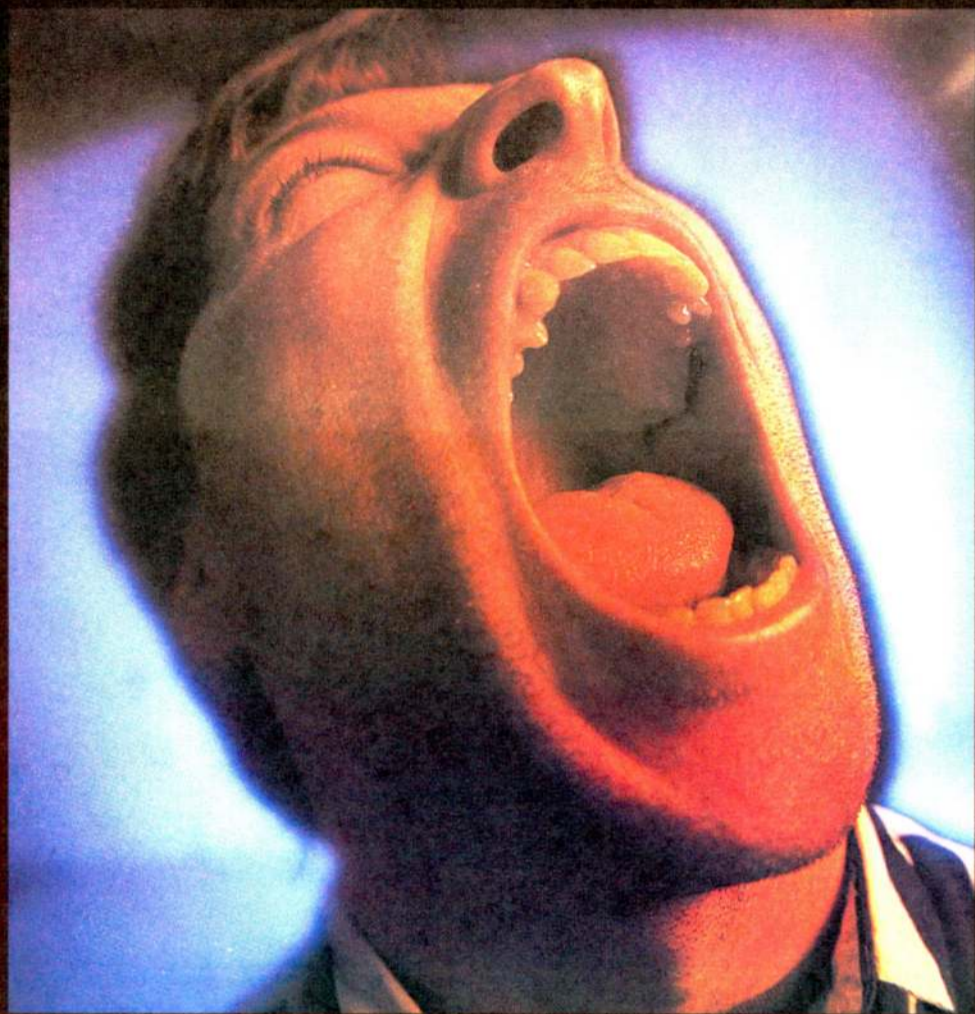


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Circle (91) On Reader Service Card

World Radio History

# Country Back in the Big Apple

► Y107, continued from page 1

Jersey shore, and WWHB(FM) in Hampton Bays, on eastern Long Island, which had been simulcasting New York's WNEW(FM).

## Covering the country side

With New York City FMs trading in the \$80 million to \$90 million range (when they're available), Odyssey had arrived at an ingenious and economical alternative. The trimulcast puts a seamless, listenable signal into most of the market. WRGX covers its home county of Westchester, as well as parts of northern New Jersey, western Connecticut and the north shore of Long Island. It also gets down through the Bronx and Queens and can be heard, with some antenna adjusting, in Manhattan.

Firing from the south, WZVU covers central New Jersey, and with a short hop across the Atlantic Ocean, makes the Nashville sound available in Brooklyn

and along the south shore of Long Island. By the time the WZVU signal quits on the Island, WWHB kicks in, covering Suffolk County all the way to Montauk Point.

While the Class A signals may have a little trouble penetrating the heart of the city, the coverage is perfectly suited for the country format. After all, pickups and Stetsons are about as common as free parking spaces on Manhattan's upper east side, which is why Y-107 has an advantage over the country station it is replacing.

Odyssey President and CEO Mike Kakoyiannis said, "WYNY(FM) wasn't the strongest signal in the New York market, and it really had trouble penetrating the fringes, which are important to this format. Their signal is much more suited to the current urban format." (No guff: as the new dance-formatted WKTU(FM), the former WYNY quickly went to number one, 12+, in the Arbitron ratings.)

Country may be the top radio format in America, but as many people have pointed out over the years, New York is not America. WYNY was only the latest in a series of Big Apple operations to give up on country despite loyal audiences. "Evergreen (owners of WYNY) needed a better return on their investment," said Kakoyiannis, who pointed out that WYNY actually had pretty good numbers. "They were usually up in the twos, and that can add up to some serious money in New York. They had some pretty good clients."

Still, Kakoyiannis acknowledged that country was not his first format choice. "We believe in modern rock, but that position was effectively taken in the New York market. Fortunately we have some very strong people in the country format," Steve Blatter, Odyssey's vice president of programming, was WYNY production director for more than three years.

All three stations are in for call letter changes, but Kakoyiannis said listeners shouldn't necessarily expect the resurrection of the WYNY calls or sound. "We want to move ahead with our own sound, completely customized for the market."

## Country lobbyists survive

Unlike other multistation simulcasts, the new Y 107 won't offer advertisers the option of running spots on just one or two of the three stations. "With our seamless signal, we'll be presenting Y-107 to ad agencies as one New York metropolitan station," Kakoyiannis said. "All spots and all music programming will run on all three signals."

While Y-107 is currently operating from the WRGX studios in suburban Hawthorne, N.Y., Kakoyiannis said plans call for an eventual move into New York City proper.

Like the demise of WYNY, the format changes on the three local stations left some disappointed listeners. The WRGX modern rock audience and oldies fans of WZVU awoke one morning to hear their favorite music replaced by a gag transition format called "TV Radio." Tongue-in-cheek one-liners like "Now your favorite TV programs are on your radio" were intoned as the stations played such golden oldies as the themes from "T.J. Hooker" and "Go Go Gophers."

Like every radio hoax since the 1938 broadcast of "War of the Worlds," this one suckered in a few listeners who demanded to know why their beloved music had been axed in favor of tunes from forgotten TV shows. WWHB listeners were spared the yucks, as the trimulcast didn't kick in there until a few weeks later.

The switch comes as a great relief to New York's relatively small but vocal contingent of country fans who had actually formed an organization to lobby local stations to resurrect the format. The big question for country listeners now is just how much commitment Odyssey has to a format that, in the nation's largest radio market, has been attempted many times and dumped just as many.

# Reporting News — and Making It

by D.C. Culbertson

**WASHINGTON** Reporters in the District of Columbia might be forgiven for feeling a sense of dread the next time they walk into a school building.

A Washington radio reporter was attacked and beaten while on assignment in November. Three weeks later, a newspaper reporter was involved in a scuffle with a principal in a public charter school in the District. Both incidents had racial overtones.

On Nov. 14, Alan Etter, a reporter for WTOP(AM), went to McKinley High School to talk with students about problems of violence in the schools, following a stabbing of two female students there.

Etter was on the school steps preparing to talk with someone from security, which was to have been stepped up after the stabbing, when he was attacked and beaten by five black youths in ski masks who hurled racial insults at him. Etter is white.

Etter had the foresight to turn on his tape recorder when he saw the boys approaching, and he caught the incident on tape; there were several eyewitnesses as well. After the boys fled, Etter sought assistance from school security, but he said he was told to go to the police. Up to that point, he had been told that school policy on violent incidents dictated that the victim go to the principal first, who would then go to police if he deemed it necessary.

Etter was obliged to call a co-worker at the station to pick him up and take him to the hospital to be treated.

According to WTOP News Director Michelle Komes, Etter normally works as the morning drive reporter and frequently covers incidents like shootings and attacks in potentially dangerous neighborhoods.

"He's kind of used to prowling around at weird hours," she said.

However, nothing of this kind had ever happened to Etter. She said he turned on his recorder not only to get a record of what might happen but also as a possible deterrent to an attack.

Etter "was pretty scraped up," Komes said, with a sprained ankle, knots on the head and neck, and numerous cuts and

bruises. At the hospital, he was treated and released. The next day he went back out in the field. Komes said Etter felt that if he didn't, "he'd be giving in to those thugs."

After Etter left, WTOP sent another reporter, Kyle Johnson, to the school for a follow-up talk with the principal. Johnson, who is black, said he became so uncomfortable with the situation at the school that he decided to leave.

WTOP reported the incident to the District of Columbia police, who treated it as a hate crime. The youths, who may not have been students, had not been identified four weeks later.

Komes said that while Etter was in the hospital, several reporters from other newspapers and radio stations showed up to cover the incident, and "they were just as shocked as he (Etter) was."

## A dangerous job

Dave Bartlett, then president of the Radio-Television News Directors Association, said the attack "didn't have anything to do with the reporter" and "told a lot more about how bad D.C. schools are" than about the potential danger a reporter might encounter. He felt Etter's "remarkable reporting" of the incident was what stood out about it.

Three weeks later, a white reporter and photographer for the Washington Times newspaper were involved in an incident at a District charter school, which is publicly funded but privately run. The newspaper said students and staff at the school, led by the principal, pushed and kicked them and seized the reporter's notes. The reporter said more than one person made racial remarks during the incident. The principal disputed the account.

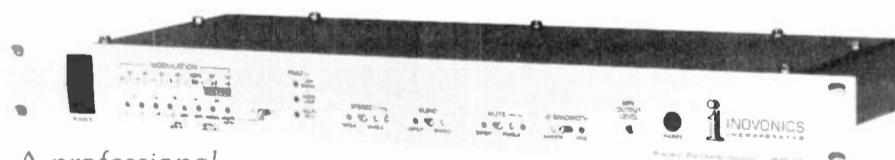
The District of Columbia is in the midst of a management crisis. A congressional control board now oversees much of the city's management. By coincidence, the day after the attack on Etter, the control board fired the D.C. Superintendent of schools and took away much of the power of the school board. The new superintendent, General Julius Beeton, said he will make school security "a primary concern," according to Komes.

After the attack on Etter, McKinley High School modified its policy for handling violent incidents.

Bartlett said that such an attack on a reporter is unusual but not unprecedented. He cited an incident in which a cameraman for a Washington TV station was beaten up in the same area of the city. He said RTNDA addresses the issue of how reporters can protect themselves in dangerous situations through its publications and sessions at its yearly convention. This year RTNDA held panel discussions on hostage situations and types of violence.

In situations like this, however, Bartlett said "you just have to take your chances and play the odds. You can't stop doing your job just because the environment has gotten a little more dangerous."

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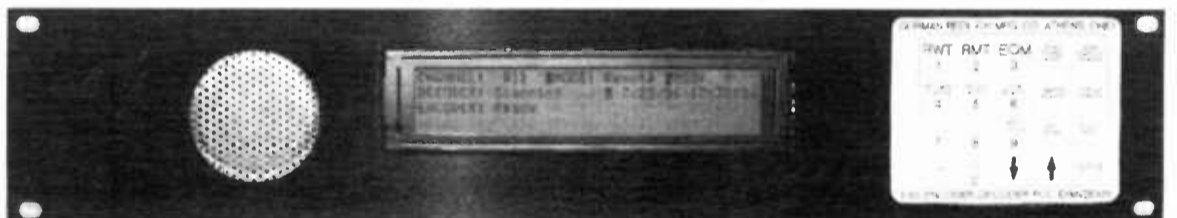
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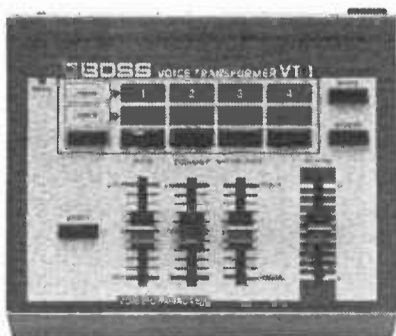
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# Low-power Michigan Station Making Waves

► **STRAWCUTTER**, continued from page 7

"When any bureaucracy is charged with regulating a constitutionally protected right, such as speech, they must do it in the least restrictive means in order to balance the people's right to be able to do something, against other people's rights not to have something interfered with."

Strawcutter claimed that the FCC's refusal to even consider licensing any

had a station like we have, with a power generator so he could have broadcast what was really happening, do you think they would have pulled that stunt?"

Asked about those comments by RW, Strawcutter said the writer at the Detroit News was the first to bring up Waco. But he said, "One of the reasons low-power stations such as this keep popping up all over the place are because of stunts our own federal gov-

down. He said he's not standing in defense of everybody who broadcasts at low power, because "some of these transmitters are causing harmonics and spurious radiation and do cause interference." Still, he said he knows he's right.

"They know that I'm right, and they should step aside," he said of the FCC. "This is the '90s! The Internet! You can sit down at a computer and virtually communicate with the world! So what's the big deal about a peanut-powered radio station communicating with a few thousand people?"

Strawcutter predicted that within a

year, 500 to 1,000 new low-power radio stations may pop up around the country. He claimed to have put his station on the air for \$10,000, but said he could have done it for \$5,000.

Strawcutter's attorney, Pat Edwards, said First Amendment rights are at stake. "The FCC may argue that there's some compelling reason that they have to restrict less than 100 W, but right now, they haven't come up with that argument," he said.

The next step rests with the FCC, said Edwards, who predicted a long and drawn-out process to come.

**'A "pirate" infers you are doing something wrong,' said Strawcutter, who maintained that what he is doing is 'absolutely constitutional and lawful.'**

thing under the 100 W level is too restrictive and not constitutional.

Strawcutter said he doesn't have a major bone to pick with the FCC as a regulator.

"We need a smooth transition of traffic in the airwaves," said Strawcutter. "But as with so many bureaucracies, we're getting more and more regulated and controlled in our society. The problem arises when someone wants to get access to the airwaves. They're generally faced with all sorts of bureaucratic haggling and hoops to jump through."

Coincidentally, FCC Chairman Reed Hundt has declared "a procompetitive, deregulatory national policy framework" to be the mantra of the commission for the coming year. Whether that deregulatory trend would benefit a low-power broadcaster like Strawcutter is far from clear.

**What's the frequency, Lenawee?**

Radio Free Lenawee is on the air 24 hours a day at 97.7 MHz. Volunteers run the morning show from 6-9 a.m., followed by an hour segment with Strawcutter and then more live programming again at noon. Satellite programs such as The American Freedom Network fill the remaining slots.

A sign in the studio states: "Radio Free Lenawee, 97.7 FM, GOD, GUNS AND GUTS MADE AMERICA. LET'S KEEP ALL THREE." The Detroit News quoted Strawcutter comparing his fight with the federal government to that of David Koresh and the Branch Davidians.

"That's one of the reasons we're doing this," he was quoted. "If David Koresh

ernment have pulled such as Waco. When the government fears the people, you have liberty. But when the people fear the government, you have tyranny. Today the average person lives in fear of their government, not of God, therefore the government is God."

The 95 W signal broadcasts solid coverage for six miles, and even "up to 15 or 20 miles, depending on how good your radio is," said Strawcutter, who maintains that the signal doesn't interfere with any other licensed station.

He contracted an engineer to determine the frequency, and went to "tremendous expense" to get a type-accepted transmitter and antenna system.

"I could have used transmission line for 50 cents a foot, but I paid \$3 a foot for high-quality transmission line. I've got a QEI 695 exciter, the amplifier is a Bext PE250 and the antenna is a Celwave."

All this, claimed Strawcutter, is by way of narrowing the controversial issues to one question: Does he or doesn't he have the right to broadcast?

Strawcutter claimed that he seized the southern lower Michigan county in one stroke when on-air operations kicked off Nov. 4.

**'Peanut-powered'**

"We had 15 volunteers at all the main intersections of town with signs that said 'Tune to 97.7 Now' ... The first day we estimate probably 15 to 20 thousand tuned us in. We had 250 phone calls live on the air. The next day the same thing. People listen to us."

Strawcutter said he's not fazed in the least by the FCC's threats to shut him

## RealAudio's Finest Hour

**NEW YORK** When Serbian President Slobodan Milosevic — faced with huge anti-government demonstrations over the annulment of municipal elections — recently tried to shut down the independent news radio station, B-92, he got a big surprise and helped ignite a worldwide movement.

Just after the government jammed B-92's signal, the station immediately began to broadcast using RealAudio streaming technology over the Internet.

Tens of thousands of students, professors, professionals and journalists immediately connected their computers to Internet web sites across the globe, reported The New York Times.

"It was the home page put out by B-92 that saved the revolution now under way in Serbia," said Sasa Vucinic, managing director of the Media Development Loan Fund, a nonprofit group that supports independent news and information outlets in Eastern Europe.

"In the early days of the protests,

before the international media arrived, it was the only way most people outside Belgrade could hear about what was happening," he said.

"And the moment the radio signal from B-92 was cut the Internet took over. Mailboxes of government officials in Europe, humanitarian agencies, journalists and supporters were flooded within hours with the news of the closure."

The radio station came back on the air as the government has eased its response to the protests and hinted it might reconsider its decision about the elections.


"The irony is that the government meant to silence us, but instead forced us to build on a whole new technology to stay alive," said Drazen Pantic, head of the radio's Internet service, to the Times.

B-92's home page is at <http://moumee.calstatela.edu/sii/b92/index.html>. The B-92 RealAudio news feed is at <http://www.xs4all.nl/~opennet/>


— Frank Beacham

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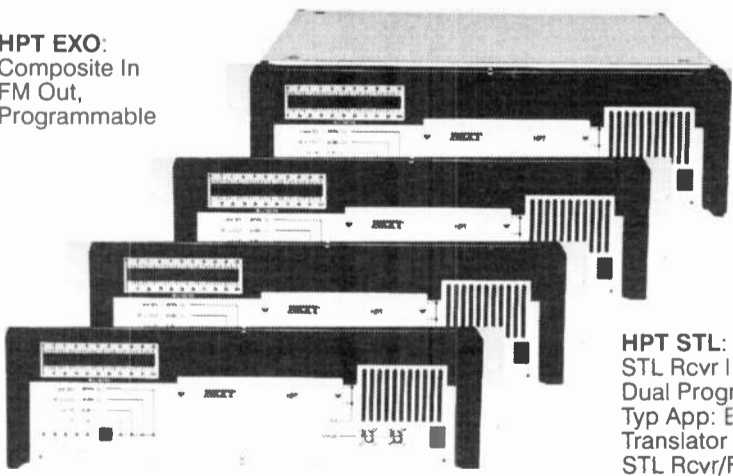
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# 'Announcing His Message'

Radio World, January 8, 1997

by Matt Spangler

**ANAHEIM, Calif.** Their daily concern is the nourishment of the soul, but religious broadcasters gathering in California this month will also have worldly concerns on their minds, including emerging technologies and maintaining harmony in an ever-changing market landscape.

Five thousand attendees, including engineers, general managers, program directors, producers, owners and sales managers, are expected to meet in southern California for the 1997 convention and exhibition of the National Religious Broadcasters (NRB) Jan. 25-28 at the Anaheim Convention Center.

The theme of this year's convention is "Announce His Message." NRB Vice President Michael Glenn said the theme "draws us back to the original intent and purpose of religious broadcasting."

On Saturday night a series of awards highlight the opening general session: Radio Station of the Year, Radio Program Producer of the Year, Talk Show of the Year, the Distinguished Service Award, and the Milestone award, which in the past has gone to shows that have aired for

more than 50 years. Up for the Distinguished Service Award are radio programmer Larry Burkette, the FamilyNet Christian network, Gene Getz of the "Renewal" program and Don Hastings of Crown Inc.

The exhibit hall opens after lunch on Sunday. Exhibitors run the gamut from the technical, such as Harris Broadcast, Jampro Antennas and Avid Technologies, to the spiritual, such as the American Bible Society and He Intends to Victory. Political organizations including the National Right to Life Committee also take part.

Equipment exhibitors say they enjoy the chance to meet a specialized segment of their customer base. Director of Sales and Marketing Jim Blum said Crown hopes to strengthen its ties with religious broadcasting networks. Crown's audio and broadcast divisions will demonstrate new microphones, amplifiers, satellite receivers and FM transmitters. Shively

Labs, which will show its broadcast antenna and RF products, touted the custom engineering services it can provide to NRB members. A number of other technology and radio service companies will also exhibit.

The educational sessions begin Monday morning. Glenn said the sessions "will focus on the many forms of communicating the Gospel." Two Hispanic radio station managers will discuss FCC violations in "The Seven Most Common Legal Problems in a Radio Station."

In "Music Formats: Who's Calling the Shots?", Bruce Kobish, president of the Gospel Music Association, and several other industry insiders will concentrate on the partnerships between Christian music producers, record companies and broadcasters.

A session titled "Pennies from Heaven?" will cover alternative revenue sources for non-commercial radio

stations that afternoon.

Managers whose stations are making a transition to digital or considering the switch will want to attend Tuesday morning's session, "The Basics of Radio Digital Editing." Also promising to be lively is "The Trial - How it Will Shape the Future of Radio Music Licensing." Participants will discuss the implications of the historic 1996 ASCAP Rate Court trial, in which the NRB Music License Committee was directly involved.

Participants in an open forum Tuesday afternoon will debate the conflicts that arise as a result of competition in a Christian market, and other issues. The session is titled "Can't We All Just Get Along?"

The official convention program, which will be available on site in Anaheim, will provide the most up-to-date information on sessions and exhibitors.

Until then, find current information on the NRB web site (<http://www.nrb.com/nrb>), or through the fax-on-demand service at (703) 330-7000, option 9. For registration information, call the NRB at (703) 330-7000, ext. 503.

Looking ahead, NRB '98 will be held Jan. 31-Feb. 3, 1998, in Washington.

The list of exhibitors at NRB '97 at press time was as follows:

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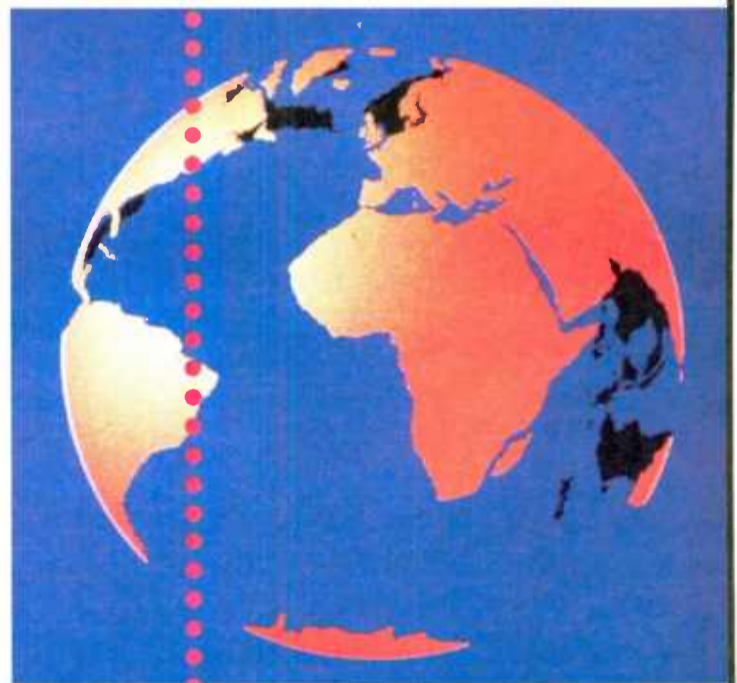
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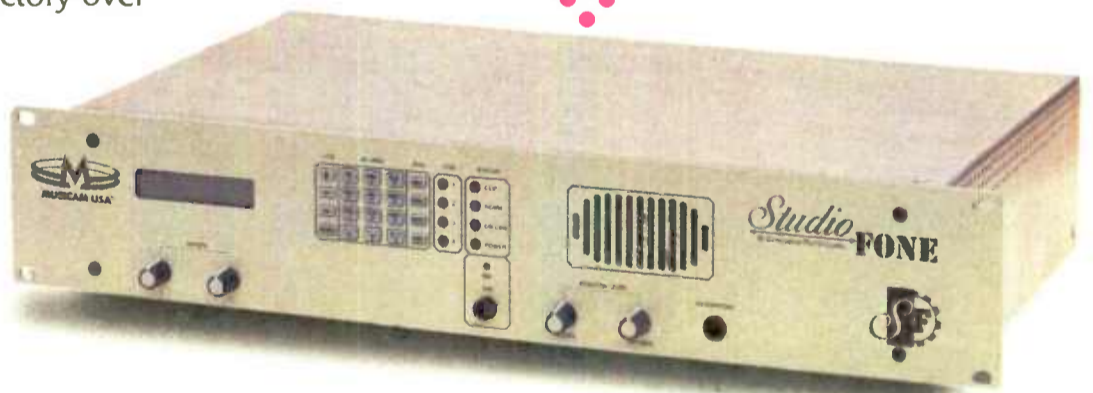
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World Radio History



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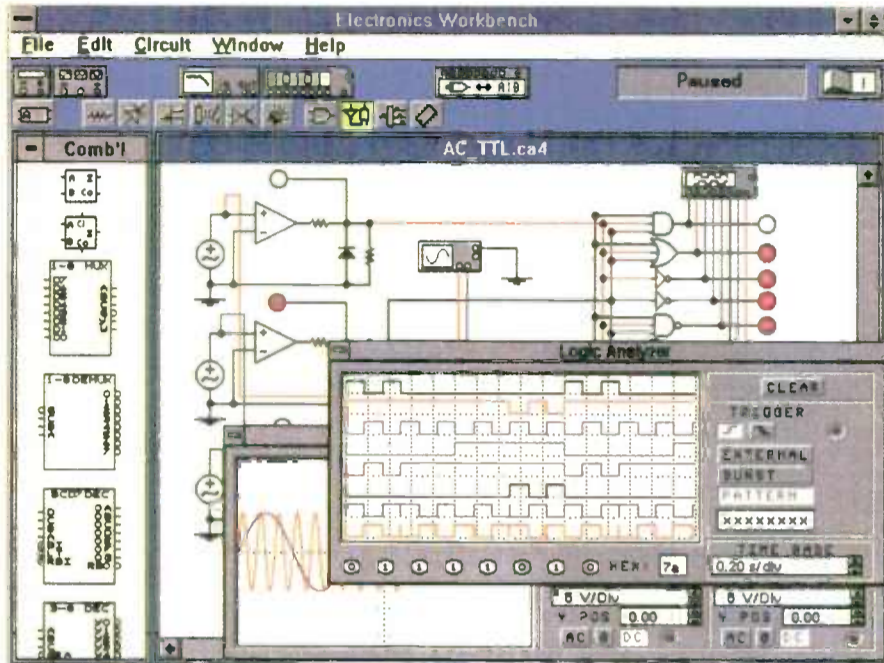


# Design, Test Circuits on Screen

**Jim Somich**

How do you prototype a new circuit? If you are like me, you pull out your breadboard and your junkbox of components. Proto boards are certainly a step above

Virtual prototyping is a method of building both analog and digital circuits on your computer. The programs consist of libraries of stock components as well as virtual test equipment. After you assemble your circuit on the computer



“air assembly,” in which you tack components together with no support whatsoever, but computer techniques now make this method of building circuitry as obsolete as your TRS-80.

screen, you can command virtual test equipment such as signal generators, scopes and spectrum analyzers. Cyberpower lets you analyze your circuit just as if you had built it with actual

components. The advantages are economy, speed ... lack of smoke if you make a miscalculation or short the power busses to ground!

Even though I have been aware of the advantages of virtual prototyping for some time, I felt the software was too pricey for casual work. Enter Electronics Workbench, an “electronics lab in a computer.” I had seen EWB advertised for more than \$200 and, at that price, it had a low priority in my mind. A few months ago, its maker ran a special. After increasing my credit card debt by just under a hundred bucks, I became the proud owner of Electronics Workbench.

### Your circuits come to life

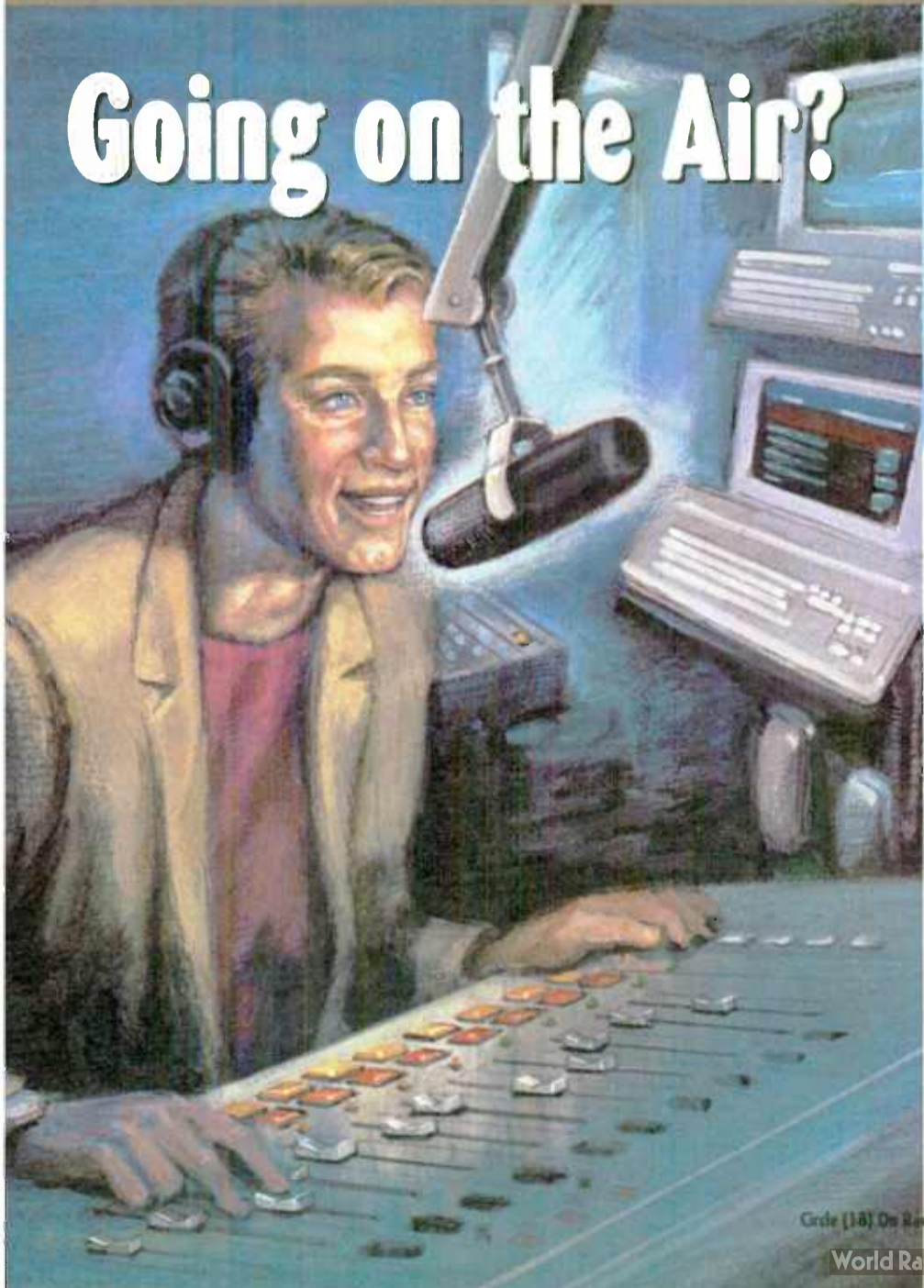
EWB was written by Interactive Image Technologies Ltd., a company with offices in Toronto and North Tonawanda, N.Y. It is the first program I have found that answers the need for a low-cost virtual prototyping program. For more information, visit the Interactive web site at <http://www.interactiv.com> or call (416) 977-5550.

Electronics Workbench is powerful simulation software. It can integrate schematic capture with a true mixed-mode simulator and a graphic waveform generator to give you the power you need. The basic program comes with more than 350 analog and digital



models; another 2,100 are available. Some of the features of EWB:

- Click and drag schematic capture
  - Mixed analog/digital SPICE simulator
  - Instant Bode plots and scrollable waveforms
  - 50 analog components with 350 models
  - 150 digital components and ICs in TTL and CMOS
  - Windows 95/NT/3.1 DOS and Macintosh versions
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- (Interactive Image Technologies is due to release Version 5 of Electronics  
See COMPUTER, page 25 ▶



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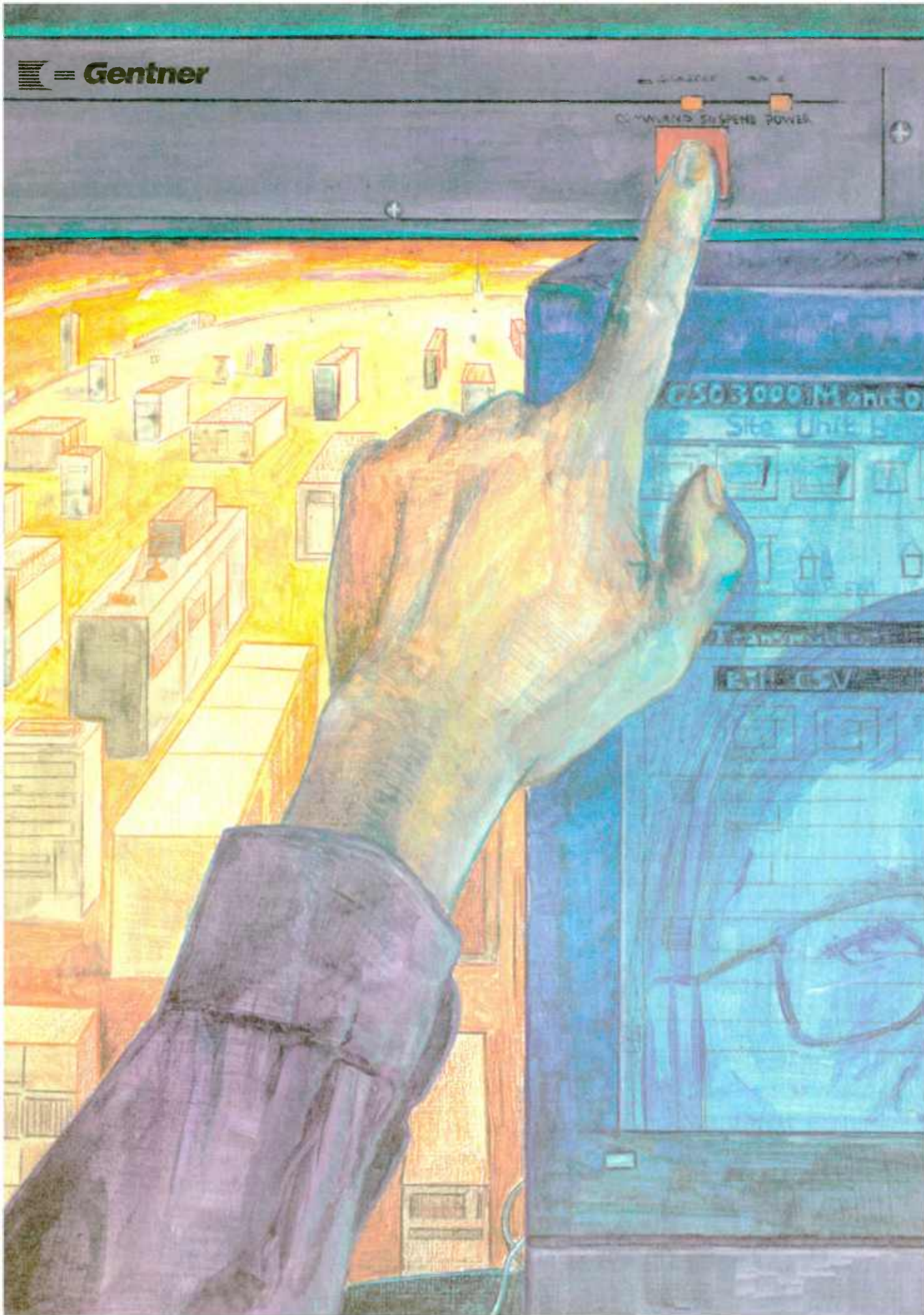
If your transmission line decision is up in the air, make sure you take a close look at HELIAX® air-dielectric cable from Andrew. Advantages over foam dielectric cable of the same size include:

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to a large number of sites with extensive requirements—it's whatever you need it to be today and tomorrow!

To accomplish this, Gentner uses a modular approach with the GSC3000. Much like the VRC product line, the GSC3000 provides micro processor-based "smart" units that establish the ability to operate transmitters from many locations. (The radio "walkaway" mode).

For more information on the GSC3000, contact Harris.

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***Cover a single site  
with minimum needs  
or multiple stations with  
extensive requirements***

## FEED LINE

# Transmission Lines in AM Systems

W.C. Alexander

## Part VIII

Just as the electrician must choose the correct size and type wire for a particular wiring job, and the plumber must select the appropriate pipe, radio engineers must choose the right size transmission line. If we choose the wrong line, catastrophe can ensue. Proper transmission line can make the difference between a system that is reliable and capable of continued operation under adverse conditions, and a borderline system that is a time bomb primed for failure. Sometimes the choice is clear and the differences obvious; at other times the limitations are hidden. In this installment of our AM Antenna series, we'll look at feed-lines and explore these limitations.

Three types of transmission lines commonly are used today to feed power from the transmitter to the antenna system. One of these is the open-wire feeder, which has several variations.

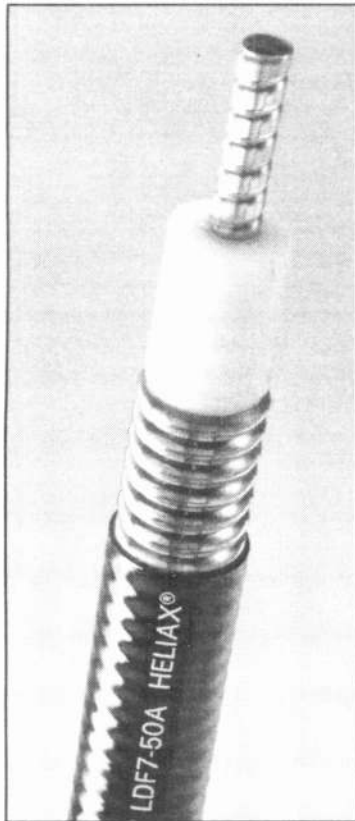
### Open-wire feeders

Transmission lines or feeders created from open (unshielded) wires supported on glass or ceramic insulators are commonly referred to as open-wire feeders. Amateur radio operators often use ladder line, which consists of parallel conductors separated by Plexiglas rods, to provide a balanced feed for high-frequency (HF) antennas. Twin-lead, which used to be the feedline of choice for television receiving antennas, is another variation of the balanced open-wire feeder theme. Neither of these has any practical use in broadcasting because of the relatively low power handling capability, but some other types were commonly used in radio's early days. Three- and six-wire unbalanced systems are the most common of these, and some vestiges of these systems remain today. No new systems have been constructed using open-wire feeders in many years.

Three-wire systems, in which two ground conductors supported on telephone pole cross-arms bracket the center RF conductor, are one such type. This type of transmission line has a relatively high impedance, can withstand high peak voltages and is relatively easy to maintain. Cracked and broken insulators as well as deteriorated or damaged support structures are the biggest problems with this type of open-wire feeder.

The six-wire feeder consists of four relatively small ground conductors bracketing two parallel center RF conductors in a cubical fashion. In effect, this creates a coaxial cable of sorts. Six-wire systems are typically supported on short creosote

poles. The impedance usually is lower than that of three-wire open feeders. Disadvantages include lower peak voltage capacity, generally lower power handling ability and greater mechanical complexity. With so many more wires — usually 8- or 10-gauge soft-drawn copper — and six glass



Foam-dielectric (above) and air-dielectric lines (right) are used widely in AM transmission systems.

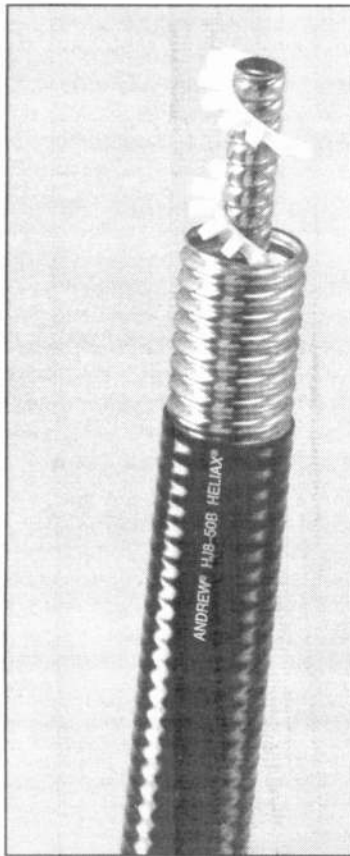


Photo courtesy of Andrew Corp.

insulators on each rather complex support structure, there are many points for potential problems.

Ice poses a particular hazard for this type of open-wire feeder. One environmental problem that is often caused by this type of feeder occurs when the spacing between ground and center conductors is sufficient to allow small birds to perch on the center conductor wires. When the birds take to flight, their wings can come into contact with the outer wires. The results of this inadvertent shunting of the transmission line are predictable. The feeder survives; the birds do not.

Open-wire feeders were used in the early days of broadcasting for a number of reasons. They could be made on site out of readily available materials; also they were capable of withstanding large standing wave ratios. In the days before the operating impedance bridge, driving point impedances in multi-element arrays were difficult or impossible to measure with any accuracy. Transmission lines that could withstand the inevitable high VSWR were needed.

### Coaxial lines

Coaxial cable is the *de facto* standard transmission line today and it has been for quite some time. As its name implies, coaxial cable is constructed using two concentric conductors on a single axis. Under the broad heading of coaxial cable are several sub-categories. In broadcast transmission applications, we primarily use semi-flexible cable, sometimes referred to by the trade names "Helix" or "Flexwell," and rigid line, sometimes referred to as "hard line."

*Semi-flexible cable* is by far the most common transmission line in use in AM stations. It is ideal for a wide range of low- and medium-power uses, and its cost is considerably lower than that of comparably rated rigid line. The term "semi-flexible" is used because the bending radius of the line is quite large. For 1-5/8 inch line, the minimum bending radius is 20 inches. Anyone who has wrestled line such as this into a tight space or through a conduit will attest that "semi-flexible" is indeed an appropriate moniker.

Under the heading of semi-flexible cable are both foam- and air-dielectric lines. Foam lines are designed for applications that do not require a pressurization path to the antenna. Their average power handling capability is lower, and loss is higher than that of air-dielectric line of the same size, but their peak power ratings are higher. This is due primarily to the higher losses of foam as a dielectric. Foam-dielectric cable is available in sizes up to 1-5/8 inch.

Air-dielectric lines utilize a spiral polyethylene spacer to keep a constant spacing between the inner and outer conductors. For safe operation, this type of line must be kept under constant pressurization with dry air or nitrogen. Usually, a dehydrator or nitrogen regulator is connected to the line at the transmitter building end of the run to provide pressurization. Weekly checks of the amount of pressure in the line should be part of the engineer's routine inspection. Leaks are a sure sign of impending trouble and should be

investigated quickly.

Air is a superior dielectric to foam, by far. It does, however, ionize more easily than foam, which produces the lower peak power ratings. Because air does not heat up as foam does with power applied, air dielectric lines can handle higher average power than foam lines of the same size. Copper heating becomes the primary average power limiting factor in air dielectric lines.

*Rigid lines* are available in sizes from 7/8 inch to 9-3/16 inches. They have inherent low losses and high power handling capability. Rigid lines are normally made in 20-foot lengths with flanges on each end. Inner conductors are made of high-conductivity oxygen-free copper that are supported inside the outer conductor by peg or disk insulators with a low dielectric constant (usually ceramic or Teflon).

If you have ever experienced a catastrophic failure of a transmission line, you will appreciate the ease of repair of rigid line. Often, any burnout is confined to a relatively small area. The affected section(s) can be replaced easily and the remainder of the line cleaned thoroughly to remove soot particles. For a fraction of the cost of replacing the entire transmission line run, a station can often have its rigid line repaired and be back on the air quickly. Many stations using rigid lines keep a spare section or two on hand along with spare connectors, flanges and hardware for just such an occasion.

We'll continue our discussion of transmission line in the Feb. 5 issue of *RW*.

■ ■ ■

*This is one of a series of articles about AM antenna systems, appearing in alternating issues of RW.*

*Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. Contact him at (214) 445-1713 or via e-mail at 76440.1670@compuserve.com*

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# Internet Broadcasting Booms

**Frank Beacham**

Internet broadcasting — a technology still less than three years old — is growing so rapidly that many experts predict it will become a universal global multimedia standard in less than two years.

The real-time streaming of Internet multimedia, and the content creators using it, have entered a period of hyperactivity on several fronts. For example, Progressive Network's RealAudio technology, which now dominates the market with an 85-percent share, leaped from about 100 call letter radio station clients in September to a total of 230 stations by year's end. New stations are entering the market almost daily.

"This industry is growing 5 to 7 percent a month," said Rob Glaser, chairman and CEO of Progressive Networks. "RealAudio is growing between 40 and 50 percent each quarter. We are still very early in the growth curve."

The concept of interactive multimedia broadcasting without a transmitter (or government regulation) caught the fancy of many of the estimated 50,000 attendees at the pre-holiday Internet World '96 exposition in New York City. The movement has spawned a new breed of content provider — part radio, part TV, part text/graphics — seeking to use streaming technology to create a global distribution media over the Internet.

## Getting personal

One exhibitor, NetRadio of Minneapolis, now claims more than 75,000 daily listeners from over 90 countries. "We are entering the era of personal radio," said NetRadio CEO Robert Griggs, "with personalized advertising tailored to personal interests."

The technology is rapidly moving toward the multicasting of media, so that millions of users can access a live feed simultaneously. Multicasting of the live audio/video stream — rather than unicasting one stream at a time to each listener — dramatically decreases the needed bandwidth and load on the network when large

audiences want to tune in to the same program simultaneously. Unicasting, on the other hand, is suited for individual listen-on-demand applications.

As a new year begins, two major developments are re-shaping the industry.

First, Microsoft has just entered the market with its NetShow technology, a component of Internet Server 3.0 for the Windows NT operating system. NetShow, now being offered to Microsoft customers at no extra charge, makes Internet multimedia broadcasting a standard component in the computer giant's server technology.

"The big thing Microsoft brings to this party is that NetShow is free," said David Oldfield, vice president of marketing for Xing Technology, makers of the competing StreamWorks system. "I think Microsoft will change this business because the server capability will cost nothing extra."

The second big development is the advent of Real Time Streaming Protocol, or RTSP. Just as HTTP (Hypertext Transfer Protocol) is used on the Internet as the standard protocol for transmitting HTML content, RTSP seeks to be a common communications protocol for the control and delivery of real-time multimedia.

RTSP was jointly developed by Progressive Networks and Netscape to address the need for an efficient, standard mechanism to deliver streaming media over the Internet. It has been endorsed by more than 40 major computer manufacturers and is now being considered by the Internet Engineering Task Force (IETF) as a proposed Internet standard.

If RTSP is approved (and virtually all major players predict it will be, including industry giant Microsoft), then the old concept of multiple, proprietary audio/video players will become extinct for the Internet user. Observers expect the result to be standards-based software or appliances that can receive all Internet multimedia, regardless of their proprietary processing or production technology.

"You won't have to have an RCA radio to listen to an RCA transmitter," said Telos president Steve Church, an advocate of an open standard for the transmission and

reception of audio over the Internet.

"RTSP not only helps create a generic environment for the end user but it solves a whole lot of problems because we'll all have a standard way of doing things," said Oldfield.

The analogy of the common radio or TV receiver for Internet media access is a bit too simplistic, said Glaser. "The big difference is that radios and TVs aren't programmable devices," he said. "You can't add new features to them once you buy them. With software, you can always upgrade and add to the consumer experience."

## Adding value

How will companies such as Progressive Networks and Xing, which sell their client-server systems, compete with Microsoft, which is giving its away? Two words, say the executives: "Value added."

"RTSP is great and super important," said Glaser. "But sometimes people think that when there's a standard it makes the whole product a commodity. That doesn't have to be the case at all. We add a ton of value today and will continue to."

As an example, he pointed to security measures for the protection of intellectual property. The RTSP transmission method provides for a handshaking between the server and the client, but it does not specify the actual security protocol. Security strategies will become a value-added product that companies such as Progressive Networks will market to their customers.

"I think if we didn't do a good job, NetShow could become a significant force," Glaser said. "But we support NT today. It turns out that 80 percent of our customers are not running on NT. They are running on Unix or Mac servers. For that majority of the market, NetShow is irrelevant."

Xing, said Oldfield, will have the same strategy. "We will focus on how to add value to the basic free availability the end user has," he said. "We think there will be a great business for those who build codecs and encoding tools."

This is where Telos, a well-known name to broadcasters, fits into the big Internet broadcasting picture. The ISO

MPEG Layer III technology used by Telos in its Audioactive Internet broadcasting system is playback-compatible with Microsoft's NetShow, Macromedia's Shockwave and an upcoming version of Apple's Quicktime.

By allowing its technology partners to shoulder the heavy marketing burdens and responsibilities, Telos can concentrate on selling encoding equipment and Internet-related production tools to its traditional client base of broadcasters and audio content providers.

"We are not in the platform business," said Telos president Steve Church. "That's why we are so strongly linking ourselves with Microsoft, Macromedia and Apple."

See INTERNET, on page 21 ▶

Marketing shapes our perception of new products, and the new WebTV set-top boxes from Sony and Philips are no exceptions. The under-\$350 units are being advertised as cheap, easy ways to access the Internet's World Wide Web. No personal computer is needed.


Twist the marketing lens a little bit and you might get another perception of WebTV. Progressive Networks CEO Rob Glaser sees WebTV as the first global Internet radio receiver. Each WebTV has RealAudio software built in. So it's just a matter of tuning in the radio station's web site and listening to the streamed audio programming.

"WebTV is ideal for Internet radio stations," he said. "You can use it to find local stations. In terms of radio listenership, it's tailor-made."

Not only can listeners tune in Internet stations over WebTV's internal 33.6 kbps modem, but the program audio can be of quite good fidelity. WebTV has 44.1 kHz, 16-bit digital stereo audio circuitry and a stereo audio output for feeding outboard sound systems.


In addition to RealAudio, the WebTV boxes also include built-in software for MIDI music and MPEG I and II.

—Frank Beacham



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► INTERNET, continued from page 20

Their platform development work supports our work on the audio side. The model for us to make money on this is with the encoder and the tools for encoding."

Oldfield predicted RTSP will become a standard in 1997. Microsoft's Giovanni Mezgec, lead product manager for NetShow, said "if RTSP becomes a standard, we will definitely support it." Multicast capability on the Internet, Church predicted, "will move fast ... we will start to see real deployment in a year, and in two years it will be pretty ubiquitous."

**How radio fits in**

As the technical obstacles diminish and the Internet becomes a standardized broadcast platform, the spotlight will shift to content providers — perhaps thousands of them.

"What happens when you have 10,000 broadcasters around the world?" asked Oldfield. "Managing them alone will be a big task. Which has what format? How do I know what I want to watch or listen to?"

Glaser sees managing this mass of content as one of those value-added services his company can provide. "We are not a producer or a network," he said. "But we (with the Progressive's Timecast service) can help people find what is out there."

What will be the role of traditional radio stations in the Internet future? Will audio broadcasters move beyond strict sonic content and add text, graphics and even video to their programming? Where does the local radio broadcaster fit on the global programming stage?

"Radio stations need to understand what this means to their business," said Oldfield. "I don't know if they have figured out yet how this influences them. Is this a new way to make money? Can you claim your audience is x-times larger and raise your ad rates? Does it mean you can now create specialized programming for a geographically dispersed audience that might have been too small for your current coverage area? Can you create special advertising sections for the global audience?"

A station can now create "communities of interest," he said, meaning communities of listeners are joined by content rather than physical location. On the other hand, stations can stress localism and regional culture, but be available to a global audience.

"This split between localism and globalism is the \$64 question," said Glaser. "I think the answer is people are doing really innovative things in each area. The best differentiate themselves by local value adds or by value adds to a specific genre of content. If you find a niche that is meaningful to the equivalent of a one or two share, you can make money. You are available in the biggest city in the world. It's called the Internet."

For those stations that worry about audience measurement in a global market, Glaser says relax. Or perhaps that's the wrong word.

"The Internet gives an unbelievable dipstick into what's going on," he said. "You can measure it by the minute, the hour or the day. No Arbitron is needed. Your RealAudio server gives you an accurate level of measurability. You can try things and get immediate feedback on what works and what doesn't."

"For radio station programmers that love audience data, this is like a fantasy come true," said Glaser. "But be careful what you wish for."

# The Mayor Is on the Air ... Again

**John Montone**

It's Rudy on the radio. In the a.m. and p.m., on the AM and FM dials, Mayor Rudolph Giuliani of New York is a ubiquitous presence on Big Apple airwaves. Not since Fiorello LaGuardia read the funny pages to the children of the city during a newspaper strike has a mayor of New York made more frequent use of the medium.

Tuesday, Oct. 29, An estimated 3 million New York Yankee fans jam the sidewalks of lower Broadway for a parade in honor of the team's World Series victory. In the parking lot of City Hall sits a radio table. Sharing the space are anchors and reporters from WFAN(AM), WCBS(AM) and WINS(AM).

At a separate table used by WABC(AM), the flagship station of the Yankees, sits the mayor in a familiar setting. He is behind the microphone.

**A city's cheerleader**

He is right at home on WABC every Friday from 10-11 a.m. for "Live from City Hall with Rudy Giuliani." On a recent show, Giuliani used his hour to tout the city, segueing from the Yankees to compliments for sanitation workers and police for their work at the parade. Giuliani makes his view known: In all avenues of life, New York City is the best.

"New York has more successful people at the top of their profession than any other place. We have the greatest doctors and the greatest lawyers and the greatest people in finance and the greatest writers," said the mayor, "so the Yankees sort of demonstrated that."

Then Giuliani used his electronic bully pulpit to press for passage of two ballot propositions, one dealing with a limit on a previously passed term limits law and another to float an environmental bond.

But the mayor discusses more than grand concepts and important political issues. He said he likes to be on the radio because "I get to hear what people have

to say, hear the legitimate complaints they have and sometimes even the complaints you don't agree with, but at least you find out what's going on."

Giuliani fields a call from Samuel in Manhattan who claims he has been cheated by the operators of an East Side parking lot. The mayor listens patiently, then promises Samuel he will have the Department of Consumer Affairs look into the matter.

"Sally in Forest Hills," says the mayor, deftly moving to the next call. "How are you, Sally?"

"Fine, you're doing a great job, Mayor. I have a problem here. The porno shops and the sleaze shops were supposed to be, as of Friday, moving out. What are we getting, the shaft here?"

"No, no," Giuliani says with laugh. He tells the caller that his initiative to drive porn shops out of residential areas has been derailed by the courts. But he's confident the city will prevail. Sally seems satisfied.



New York City Mayor Rudy Giuliani

**All over the dial**

Rich Lamb, a veteran reporter for news station WCBS and host of a monthly show called, "Ask the Mayor," said Giuliani is "doing a lot more radio than some of us who are on the radio." Lamb is impressed with Giuliani's on-air acumen. "If he

weren't mayor, he could easily be a broadcaster."

Not everyone is a fan. Recently, Ted Turner charged that the mayor has fought to get Rupert Murdoch's Fox News Channel onto the city's cable system in exchange for Murdoch helping Giuliani's wife with her career. The mayor described Turner as "out of control," and ripped local newspapers for not mentioning that he is also trying to help The

Bloomberg News Service get on the cable system.

Another media-smart politician, former mayor Ed Koch, has his own show on WABC each morning. But he is feuding with Giuliani, and has announced he will not endorse the mayor in the next election as he did in 1993. Koch professes not to

See GIULIANI, page 23 ►

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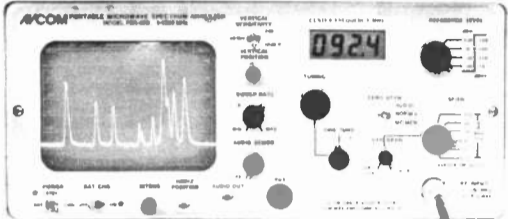
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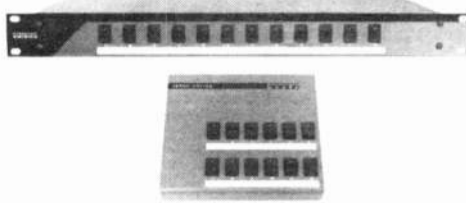


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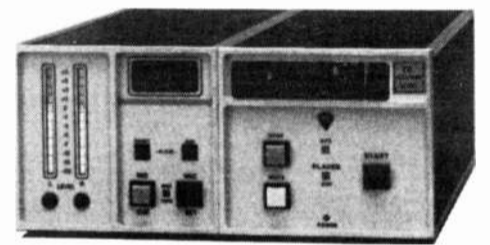
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# Big Groups Discover Buying Power

Lynn Meadows

Radio groups who went shopping for new stations in 1996 will be shopping for new equipment in 1997. Everyone loves a good deal, and as radio groups grow in size, it could mean their dealmaking days are just beginning — a thought that makes equipment distributors and dealers slightly uneasy.

Now that the number of radio stations a group may own is limited only by available credit, managers of groups with a critical mass of stations are beginning to

realize their newly found purchasing power.

Take the example of Emergency Alert System (EAS) equipment. The Federal Communications Commission (FCC) mandated that all stations must purchase and install an EAS box by Jan. 1. While many stations took a direct hit of \$2,000 or more to their bottom line to buy the new equipment, groups like CBS/Westinghouse and Infinity who could "buy in bulk" enjoyed hundreds of dollars in savings.

### Trust and loyalty

Distributors and dealers are not blind to the power of these new mega-groups. One concern is that the groups will begin

buying directly from manufacturers instead of using dealers and distributors.

Some manufacturers are making it easy. Innovative Quality Software (IQS), for instance, worked in the past with Harris, Broadcasters General Store, Broadcast Supply Worldwide and others to distribute its SAW audio software. IQS recently chose to sell direct.

"I don't truly think that this is going to be a trend," said Kathy Johnson, director of sales and production for IQS. She said the company did not have any complaints about its broadcast distributors but felt like the computer and music stores it worked with were not learning to use its product or pushing it hard enough. She

said that to be fair, IQS cut out all its distributors in order to sell direct.

Ironically, IQS had the highest sales month in its history the first full month it went direct, said Johnson. Still, she said, the company has not ruled out returning to the use of authorized distributors.

If a manufacturer is willing to sell direct, what would stop a large group from buying that way?

"That's a big question mark for us too," said Chris Shute, vice president of distributor Broadcasters General Store. While some groups are trying to take the direct route, he said, the trust and loyalty developed with customers will be an important asset to distributors.

Shute said that Broadcasters General Store does more than just place an order with a supplier: it tracks that order and

See GROUPS, page 24 ▶

## Giuliani Masters the Radio Dial

▶ GIULIANI, continued from page 21  
listen to Giuliani's program.

"I'm a practicing lawyer, and I do my radio show out of my law office," Koch said. "The rest of the day I'm working at other things."

On the radio, Giuliani has direct contact with his constituents. He is savvy enough to know that different people listen to different stations. Each week he delivers a three-minute address on news station WINS. On a day in late October, the first items of his public schedule read:

**6:20 a.m.** Live radio interview with Scott and Todd (WPLJ(FM))

**6:30 a.m.** Live radio interview with Mazer in the Morning (WEVD(AM))

The next morning he is on WOR(AM) on the "Rambling with Gambling Show."

Back to the phones. It's Thursday night, Nov. 7, on WCBS, News Radio 88. Steve from Manhattan wants to know what the city will do to keep the Yankees from moving out.

Giuliani seizes on the question to repeat his oft-stated position that he would love the Yankees to stay in the Bronx. But if George Steinbrenner wants out of the Bronx, "Then I've got to think about the whole city and I'll negotiate with them on the site on the West Side of Manhattan."

But for every call on a major pressing issue there is someone like the guy from Queens who calls to complain about an overgrown Norway Maple that is hanging over his house, posing a danger to the roof and to people. "It's badly in need of pruning," says the caller.

"Tomorrow morning somebody will call you and we will get that done," the mayor promises, his tone of voice suggesting an overgrown tree is every bit as important as where the Yankees will play. "I'll make sure the Parks Department gets that done quickly."

Another satisfied constituent in radioland.

◆◆◆

John Montone is a radio reporter for 1010 WINS(AM), New York. Send him e-mail at jfmontone@worldnet.att.net

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# Buyers and Sellers

► GROUPS, continued from page 23

follows up on it later. Like other distributors and dealers, Shute said he sees his company as working for both the buyer and the seller.

## Centralized engineers

Rich Redmond, sales manager of distributor Northeast Broadcast Labs, said he was confident some groups would order direct from manufacturers. But Redmond said those who do use distributors and dealers will be looking for "value-added" service from that supplier.

A lot depends on the way a radio group organizes its engineering department. Some radio groups, said

Redmond, will hire a complete and competent technical staff that can recommend the best products and equipment for the groups' applications. When the group is ready to buy equipment, having already done the research, its predominant interest will be finding the best price.

Other groups, however, are hiring centralized engineering managers. These managers do not have the time to research what is available, let alone decide which product is the best for their applications. Redmond said these managers will have to rely on distributors and dealers to be part of their team.

Kathleen Karas, branch manager of

Crouse-Kimzey in Annapolis, Md., agreed that distributors are especially helpful in groups with corporate engineers who do not have time to read up on every new piece of equipment.

"We do the research," said Karas. She said her office operates as more of a purchasing agent for the client. It is a niche that works well, because so many stations have let their engineers go and have no one to ask for advice. In a world of consolidation and outsourcing, noted Dave Burns, studio product manager for Harris Corp., the distributor is a resource that does not affect payroll or benefits.

## Muscle only so strong

No one interviewed by *RW* predicted the imminent demise of the distribution industry based on the enhanced leverage

of large radio groups. Certainly, there is some equipment that even the biggest radio group will never have the leverage to buy direct, including products used in other professional arenas like sound reinforcement and the music industry.

"I don't think people will go straight to a microphone manufacturer to buy microphones," said Tyler Callis, sales manager for the Broadcast Supply Division of Continental Electronics. Callis is in the middle of the entire debate: he was hired by a manufacturer, Continental, to start a broadcast supply division that sells products made by other companies as well.

According to Callis, much of the audio equipment that radio stations buy is equipment used by the music industry. Items like microphones, amplifiers and speakers are sold by the thousands to stores like Best Buy and Circuit City.

Even if a huge group wants to buy 120 amplifiers, Callis said, the manufacturer will probably tell the group to go to a dealer. It is with traditional broadcast items like transmitters or telephone hybrids, said Callis, that the large groups will have the ability to go direct. Johnson of IQS said there is "definitely a need for the broadcast distributors" for those products that are not so specific to the broadcast industry.

Burns of Harris said also that manufacturers will be reluctant to do the bookkeeping that they pay distributors to do.

"We do the credit, we extend net 30-day terms, we make leasing available," said Burns. He said Harris also gives advice and makes suggestions for buyers. "They're not going to get that by dealing directly with manufacturers."

Callis of Continental said that this new era may test whether manufacturers give credit where it's due. Typically, when someone wants to buy direct, a manufacturer will refer them to its distributors. If a distributor has done the "evangelistic work" of talking up a manufacturer's product, said Callis, that company deserves some of the sales.

The distribution industry has been going through an evolutionary "survival of the fittest" process for a while.

"I'd say a lot of the smaller distributors have already been weeded out," said Karas.

The "fittest," it seems, are the ones who offer more than just equipment. Redmond of Northeast Broadcast Labs said the new corporate engineer needs a distributor who does more than hand out a catalog and an 800 number. He or she needs their distributors to be "solution providers," he said.

"There are two very good reasons why distribution will stay in place," said Burns. On the supply side, he said, manufacturers do not have the time or staff to handle several hundred customers. On the demand side, the radio stations do not have the personnel to call vendor after vendor to learn about their products. To go to multiple vendors, he said, buyers go to one location: the distributor.

Karas said purchasing groups should keep their options open.

"While they may be able to get what they need interfacing directly with manufacturers, they should be careful not to drop their old channels of supply," she said, adding that purchasers will always want someone who can be a little more objective than the manufacturers.



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World Radio History



# Computer Prototyping

► **COMPUTER**, continued from page 17  
Workbench, for use with Windows, this month. It promises even more features and power.)

I found the program to be easy to understand and use. It is amazing the first time you see your circuits come to life on screen. With EWB you can easily build an analog or digital circuit schematic, attach simulated test instruments, and turn on the power to see how it works. Circuit behavior is simulated realistically, and the results are quickly displayed on the multimeter, oscilloscope, Bode plotter, logic analyzer or whatever instruments you have attached to the circuit.

## Complex filter

My first challenge to EWB was the design of a complex lowpass filter. My virtual parts bin provided a wide variety of "perfect" components that I dragged onto the screen. A few minutes later I had "wired" my prototype and attached virtual test equipment to check my results. The Bode plotter showed the frequency and phase response of my circuits at every frequency. It was easy to substitute different values in the circuit to come up with the performance that was required.

Electronics Workbench is modeled on a real electronics workbench. The large central workspace is like the breadboard, the parts bin is beside it, and the parts bin buttons and test instruments are stored on a shelf along the top. You build and test circuits entirely on the workspace using the mouse and menus. Everything you need is readily at hand.

Why use an electronics lab in a computer?

Defective parts, limited access to instruments and the possibility of accidents are part of life in a real electronics lab. Virtual prototyping not only removes these disadvantages, it also provides powerful computational tools beyond what is found in a real lab.

Equipping an electronics workbench or laboratory can be expensive. Software simulates a lab at a fraction of the cost. And the endless supply of unbreakable components reduces the cost of materials. Building and testing circuits using a simulator is fast, amazingly so. If you have limited access to a real lab, you can make the most of it by designing and testing circuits first on your computer.

These tools combine the math calculating power of computers and the ability of mathematical models to represent circuit behavior. Also, a Bode plotter (for frequency analysis) and a logic converter (for conversion of truth tables and Boolean functions) go beyond the capabilities of real test instruments.

## Experiment safely

Learning from mistakes can be instructive, but when the subject matter is electronics, it can also be dangerous. A simulator lets you experiment safely, without fear of electrical shocks or equipment damage.

Real components often do not have the values they should. For example, a 10k ohm resistor is not exactly 10k ohm, and two "identical" transistors may not be exactly the same. Virtual prototyping uses ideal "components,"

so the simulated values are the same as your calculated values.

Even if you only want to prepare cir-

cuit schematics, you can save time by creating them with a simulator. You can then copy the screen onto your Windows

clipboard and place it in another application. Or, for DOS users, you can capture the circuit (or any part of the display) and place it in an application that accepts .PCX graphics files.

The Electronics Workbench screen shows the unlimited library of passive

use standard Windows commands to place components, wire them and connect the test equipment.

When your circuit is complete and ready for testing, turn on the power switch in the upper right-hand corner and your circuit behaves dynamically just as if you had built it on your breadboard. Changing values or modifying the circuit is as simple as dragging and dropping.

A lot of experimenters are resistant to new technology. Old habits die hard. But I have become a believer. This is the only way to design circuits. Software technology is now available at reasonable prices. Only a few years ago, such tools cost thousands of dollars. Check out Electronics Workbench and similar programs and simplify your design projects.

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and active components down the left-hand side, with virtual test equipment stored on the virtual shelf at the top. You

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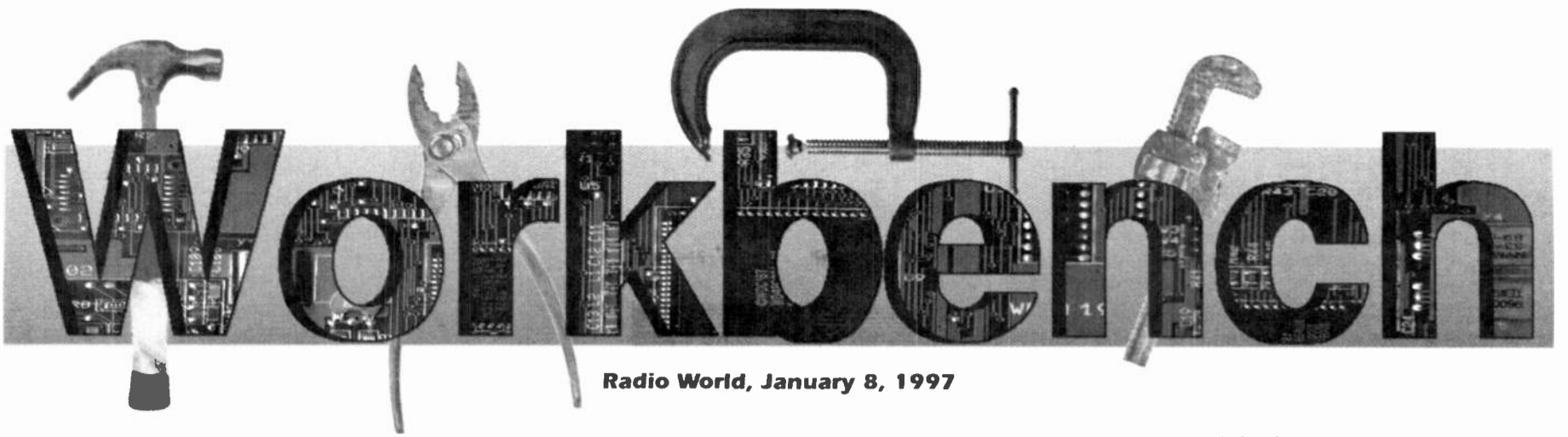
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PACIFIC RESEARCH & ENGINEERING

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World Radio History



Radio World, January 8, 1997

# Resolve to Keep Better Logs

John Bisset

As we start the new year, the wise engineer's thoughts should turn to logs. If you can devote a half a day, maybe on a weekend when you can work without interruptions, you can do some planning that will make your life much easier.

First, the issue of last year's logs: If you haven't organized any daily operating (transmitter) logs either by month in a binder or in individual file folders, now's the time. The same is true for your maintenance logs.

A drawer full of neatly organized logs is an impressive sight to an FCC inspector. To conserve file folders, we label three sets with the names of the months; the first two sets contain the last two years of logs (one folder for each month), and the third set holds this year's logs.

While you're going through the logs, check two other things. First is EBS. If you don't have your own EBS send/receive summary sheet for the past year, use Ed Burkhardt's (call Burkhardt Monitoring Service at (804) 261-1800). Locate the date and time each test was sent. This, too, is impressive to an inspector; it shows diligence with regard to EBS.

Also check that you have a record of a tower inspection for each quarter of the year. We write these up separately, and file them with the maintenance logs. Add a blank on these forms to indicate when the last quarterly test was conducted. You'll find the ability to locate all four quarterly reports useful.

Why all the hubbub about neat logging? I had the pleasure to speak on a panel at the Pennsylvania Broadcasters convention this past fall. The panel fielded questions from about 75 engineers in the audience. The first question was, "How do I ensure my job security in today's age of mergers and acquisitions?" The first answer was to demonstrate your competence and dedication to your job.

Having done a number of "station inspections" prior to sales, and talking to others who do the same, I can tell you one of the first things checked is the logging. It's just like checking the back of an equipment rack: One look is worth a thousand words. If the logs are neat and organized, they demonstrate attention to detail ... a quality station owners seek.

Would you let a surgeon operate on you if his office was a dump, papers were lying everywhere, and he couldn't put his hands on your chart? Of course not. In the eyes of an owner who many times has just signed a note for millions of dollars, disorganization is a good standard with which to judge employees. If you fail it, you may find yourself on the way out. To an engineer charged with "fixing things," this little bit of window dressing may

seem trivial. Try it, and see what happens. I'll bet you'll be surprised by the comments.

\*\*\*

As engineers juggle three or four stations these days, the term "routine maintenance" may soon be unknown in our lexicon. A lack of periodic transmitter inspection can be fatal.

An engineer called us into a site to evaluate a fluctuating power issue. The RF power would dip, then jump back up. Our first thought was a loose something,

**Our first thought was a loose something, somewhere.**

**We planned to come back after midnight and investigate.**

somewhere. We planned to come back after midnight and investigate.

On our return, the power was stable, but lower. No amount of retuning the transmitter could get the power back up. We shut the rig down, and started looking. The rig was an RCA-BTF-20E1, and everything appeared fine until we looked under the tube at the bottom of the socket. The two brass connected feeders, which feed filament voltage from the cavity feedthroughs to the tube socket, had worked loose. They were not making a good connection. I surmised that the blower air was causing them to wobble, making and breaking the connection and causing the output power fluctuation.

The connections were severely corroded and burned because of the heat. We removed the terminals and cleaned everything thoroughly with Scotchbrite and alcohol. The rig was back to normal as soon as it was turned on. I don't know why connections work their way loose, and must tell you that I used to scoff at the maintenance duties that included the mandate to "check all connections for tightness."

Not any more. Whether it's little gremlins that loosen the nuts, or simply vibrations from the blower motor, the problem can and will occur, even in ATUs with no blower to vibrate. Thanks to my associate Scott Taylor for contributing to this tip.

\*\*\*

Today's broadcast engineer is usually responsible for the entire technical plant. That may also include security. Pinkerton Security offers a free publication called SOLUTIONS, which offers insight into

the most critical security issues facing business and industry in the '90s. The publication is free; circle Reader Service 89.

\*\*\*

Here's a little gem to keep in the back of your mind. Did you know that by filing off the two little "locking tabs" found on a bnc female connector, that an "N" male will match perfectly? Need to reverse sexes? How about clipping off the twist lock portion of the bnc male on the end of a cable, for a nice fit into a chassis-mounted Type "N." These aren't permanent solutions, but will work in a pinch. Better, pick up a YC-40 Unidapt Universal Adapter Kit from Connectworks. For under \$200, you can match practically any RF connection. BSW is one distributor that sells these; call (800) 426-8434 or (206) 565-2301.

\*\*\*

Here's an FM transmitter tip to wrap up this month's column. My associate Tom Ringer came upon a station with low power. Even with the exciter cranked up all the way, the output was still lower than its specified 20 W. Tom ran the output through a wattmeter and into a load, and measured a full 20 W. A closer inspection of the exciter cable revealed that it was 75 ohm cable, not 50. The proper cable produced plenty of drive.

It's hard to say how long the rig had been running this way, and I guess it's a testament to the exciter's stamina. The moral to the story: never assume anything! Just because you know the transmitter and exciter wants to see 50 ohms doesn't mean it was wired that way!

■■■

John Bisset is a principal with Multiphase, a technical service company based in the Washington suburbs. Reach him on line at wrwbench@aol.com or at (703) 323-7180. Fax Workbench submissions to (703) 764-0751. Published submissions qualify for SBE recertification credit.

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# Running Radio

Radio Station,  
Radio Shack:  
See page 31.

Radio World

Resource for Business, Programming & Sales

January 8, 1997

## Copyright and Wrong on the Internet

Alan Haber

Copyright issues constitute a critical component of Internet planning by radio stations. In view of the possible infringement issues, the process of checking and rechecking "who-owns-what" is a pretty good idea.

In this and subsequent articles, we will explore copyright issues and how they affect radio stations doing business in cyberspace.

### Serious about the 'net

Because much of the potential of the Internet remains uncharted, stations find themselves at constant crossroads. Will this work? Will that? The questions appear endless.

Yet more than 1,700 stations in the United States maintain Web sites, according to the MIT List of Radio Stations on the Internet (<http://wmbmr.mit.edu/stations/list.html>). Approximately 200

stations and Internet-only broadcasters beam their on-air signals to computers here, there and everywhere. They must be serious about the Internet, right?

Seattle classical station Classic KING-FM (<http://www.king.org>) has been in



cyberspace since December 1995. General Manager Peter Newman said being on the 'net gives KING "big visibility in the broadcast community" and a modern image with its listeners.

"Even when we're on the air, and our morning show host says 'Time is 7:43 a.m.; good evening if you happen to (be) listening in Singapore,' that transmits, I think, an implicit message to our local audience about being somewhat 'with it,' on the cutting edge, technologically

adept ... Especially in the Seattle area, where we've got that little software company across the lake, that's not an unimportant thing."

The KING staff works to make sure copyright issues are satisfied. Since April, the station has blocked recorded commercials from its Internet feed, thanks to a relay system developed by its engineers. It is not hiding the fact, either: a recent edition of the KING on-line "Web Notes" spelled out the details.

"The truth is, a good commercial model for Internet broadcasting has yet to be established," wrote Newman. "We doubt if our listeners in Budapest are well-served by an ad for an auto dealer in Seattle."

When recorded commercials air on the KING air signal, a CD jukebox plays classical music on the Internet feed. Nor does the station bump commercials only. When the Metropolitan Opera began a new season of Saturday afternoon broadcasts on the station in December, they were cut off from opera-hungry cyber-ears.

"Welcome to the new world of on-line broadcasting!" Newman wrote to his web listeners.

KING first considered split programming because of rights for syndicated programs it carries like the Metropolitan Opera. Newman said he took a look at the entire rights issue, considering ASCAP, BMI and related matters. He also considered rights regarding commercials.

"I'm not convinced that I've seen language in commercial contracts that really addresses any of this or that gives stations specific rights to broadcast any commercial that we're running on the air ... whoever it is."

Newman said KING has a joint sales agreement with Bonneville Broadcast Group, which re-sells KING airtime locally.

Because the contract with Bonneville "was developed really before the advent of Internet broadcasting, and there's nothing in the contract which speaks to Internet broadcasting ... we don't get any revenue advantage from having a spot air (on the Internet)."

So KING decided not to "air" commercials and the Metropolitan Opera as part of its Internet feed.

See COPYRIGHT, on page 29 ►



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## 'X' Marks a Site of the Month as Station Rocks

Alan Haber

A tip o' the old frostbitten ears to all you loyal Haberspacers, snug in, under and behind your trusty electric blankets when you're not busy outside shoveling the piles and piles of snow you're more than likely having to deal with right about now.

Up here at the ever-busy, ever-weather-proof global Haberspace headquarters, we don't get very much snow ... although, one time, there was this guy from the cyber-post office who had a lot of dandruff and it just about resembled some kind of snowstorm. That, however, is another story.

And that's what we've got a ton of this month: lotsa stories about radio stations and their adventures on the Internet. And the very first appearance of my pal, Poochy the Cyber-Mutt, and his "Poochy's Pick." But first, this nugget that didn't make it into last month's Space-fest:

These days, as you know, when we say "radio on the Internet," we don't necessarily mean "traditional" radio. That's why "broadcasters" such as Station2000 (<http://www.station2000.com>), formerly Radio 2000, are popping up all over the web.

Station2000, anchored by veteran DJ



Jim Ladd, is a throwback of sorts to FM rock radio, the way it used to be. Featuring the Ladd-hosted program "Headsets," live concerts from groups such as Styx and Bad Company, and interviews, this "station" lets listeners construct an FM radio experience piece by piece. I found it kinda cool, and you might too.

Now, on to this month's cyber-booty.

See CYBER-MUTT, page 35 ►

► COPYRIGHT, continued from page 28

These factors could change. If they do, Newman said, "It certainly would be worth our while to investigate what spots could appear on the air and what rights we'd have to pay and so on." But now, he said, "since we have the little switch in place anyway, why not just block that stuff?"

The Metropolitan Opera had a say in the decision, too. It insisted that its Saturday afternoon broadcast be pulled from the KING Internet feed.

According to Press Representative Peter Clark, the Metropolitan Opera does

and the Internet, is a complicated and important one.

It's a "comparatively easy decision" for KING to hold onto its Internet feed, because, Newman said, a lot of what the station plays "is in the public domain." Managers of other stations may find the decision more complicated.

**Above board**

"I think a lot of stations that may be on the 'net right now are doing so at the very edge of, if not over, the line as far as how they've handled rights issues," said Newman. "We are trying to do everything as above-board and by-the-book as possible."

"It was an oversight on our part," he said, "that we didn't contact the Metropolitan Opera ahead of time and, when they said 'Cease and desist,' we did it." Newman even removed a link to the Met's web site from KING's site.

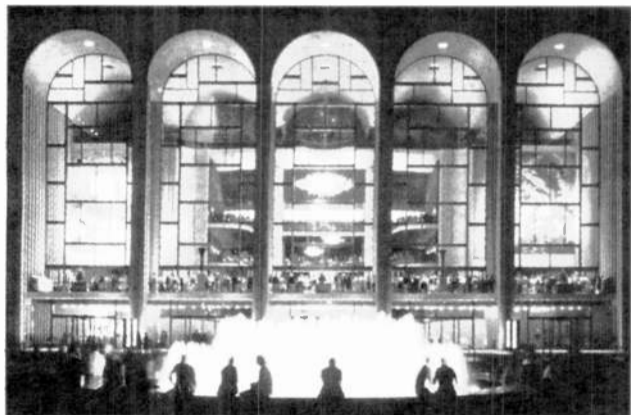
KING is talking with representatives of other programs it carries about rights issues. Newman said, "From now on when we do a contract, this will come up." Newman thinks that "there's a great deal of misunderstanding" about the Internet.

"There's a tendency," he said, "to just be afraid of something that's new." In defense of the Met, he said, "There really are some rights, legal issues which are operating in the shadows, and, in a way, I don't fault somebody for being safe about it."

KING has signed up with ASCAP and BMI; the station is paying fees to avoid problems later.

For Newman, it's a cost of doing business. "At the present, the amount that ASCAP and BMI (are) charging us is so small that it's not worth getting too excited about," he said.

In an upcoming article, KING develops a cyber-relationship with ASCAP and BMI, and the two licensing giants speak.



The Metropolitan Opera insisted that KING pull its program from the Internet feed.

not "have the rights to broadcast in some countries" and "unions ... are not paid for rights for certain countries."

Newman said he tried to argue with the Met, "but they felt that their contract did not include Internet broadcasting, and I just didn't really want to get into a fight with the Met. To tell you the truth, it's just not important enough to pursue it."

Newman said that, at some point, "if we or somebody else is broadcasting the Met on the Internet, they'll probably end up paying us for it, for the same reasons that one pays for commercials to appear on radio stations ... if at some point you can establish that there is economic value to being on the 'net, which is a whole other issue, too."

The KING-FM case demonstrates that the copyright issue, as it applies to radio

## Earl Pitts: 'Wadn't Me'

The Dec. 18 arrest of FBI agent Earl Pitts on espionage charges has not been lost on WLW(AM)'s Gary Burbank, nor on his alter ego: an ultra-conservative redneck character commentator Burbank has been syndicating since 1986 named ... Earl Pitts.

Burbank has featured Pitts for years on his radio show and syndicates him to 160 stations. When agent Pitts was arrested outside Washington, D.C., the phone at Burbank Creations did not stop ringing.

The irony of an alleged spy sharing the unconventional name with a fictional and incurably right-wing

conservative was irresistible to Burbank. In a press release, Burbank's alter ego declared, "It wadn't me."

Pitts claims the FBI's Pitts is possibly a "turn-coat, coward spy ... who just happens to have a great name." And, discounting the idea of pretending to fix a roof for the sole purpose of watching a neighbor sun-bathe, he has never spied on anyone before.

Steve Harper of Burbank Creations noted numerous calls from newspapers and radio affiliates the morning after the arrest.

—Alan R. Peterson

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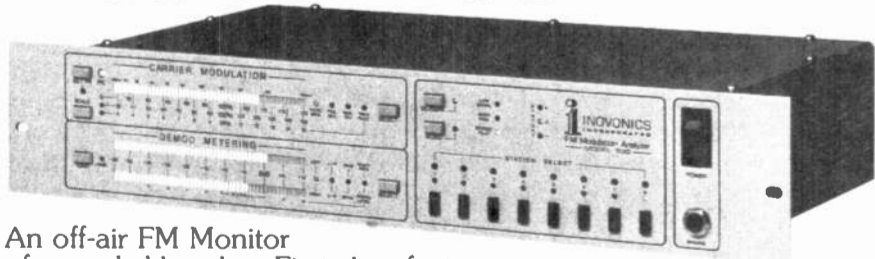
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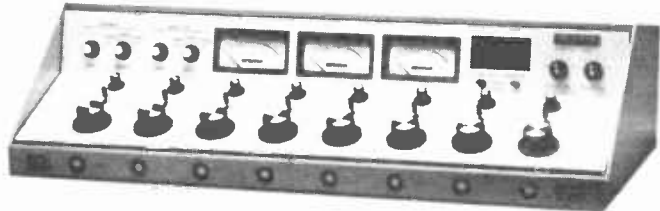
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# Radio Station Meets Radio Shack

Lee Harris

Most radio engineers will tell you that it would be pretty hard to stay on the air without the occasional aid of the local Radio Shack. When you need a connector or a resistor in a hurry, you often have few alternatives.

KPYK(AM) Terrell, Texas, is even more dependent on the local Radio Shack than most stations. The store and the radio station are co-owned and located in the same shopping center. Radio veteran Len Mohnkern and his son Chuck took over KPYP on April Fool's Day 1992. Chuck had been running the Radio Shack in Terrell's Town West Plaza since 1980, and he and his dad had been watching for years as the 250 W station a few doors down struggled through a succession of owners and formats. Father and son even worked for the station at various times, but they felt that if they wanted it run right, they would have to run it themselves.

Finally, they made a deal and got the keys to the station, located in a former gym between the Mekong Chinese Restaurant and the Mautz 5&10.

"We wanted to make a strictly local station. Most of the (owners) in recent years had been trying to serve Dallas," Len said. "When we took it over there weren't any local accounts. Of course, we still don't have a lot."

### Big band, overnight talk

Not surprisingly, Radio Shack immediately signed on as a major advertiser, taking eight or 10 spots a day. A few other businesses in the shopping center also signed on to show their support. But even with that guaranteed account base, Len acknowledged that the going has been tough.

"We had an interference problem from a nearby station that just about put us out of business before we got the FCC to take any action. They were causing us severe interference as close as two miles from our transmitter," he said.

That problem was cleared up after about a year of struggle and some help from U.S. Representative Ralph Hall, D-Texas. Finally, the Mohnkerns could begin concentrating on rebuilding KPYP. They instituted a live big band format, and inserted heavy doses of local news, written and anchored by veteran newscaster Len. They also added such classic local radio touches as live broadcasts of city council meetings and high school sports (the best money-maker, according to Len).

While KPYP technically is a day-timer, the station stays on 24 hours a day, making use of the FCC's generous allotment of six watts at night. The Mohnkerns say the night signal usually covers most of Terrell, unless Mexican superstation XERF, also on 1570 kHz, starts busting through on the skywave.

Chuck Mohnkern designed an automation system to run the Talk America network from 10 p.m. to 6 a.m., using, of course, parts from Radio Shack.

"I had an old Tandy 1000 here at the store that never sold, so I built an interface board to plug into the parallel port. It watches for cue tones and fires off the cart machines. I wrote the program to do all that and thus the automation system

was born."

The production room uses Sound Forge software on another Tandy com-

puter, "one of the last Tandy computers ever made before they sold out to AST," Chuck said. KPYP also has a Radio Shack cassette deck, telephones, mic

stands and various other odds and ends from the catalog.

Len Mohnkern manages to keeps

**Many listeners are aware of the connection between the store and the station, and they sometimes offer programming compliments while shopping.**

puter, "one of the last Tandy computers ever made before they sold out to AST," Chuck said. KPYP also has a Radio Shack cassette deck, telephones, mic

KPYP on the air with a staff of three: himself and two part-time announcers, one of whom also works part-time at (where else?) the Radio Shack. "We

spend a lot of time running up and down the sidewalk here, helping each other out," Len said.

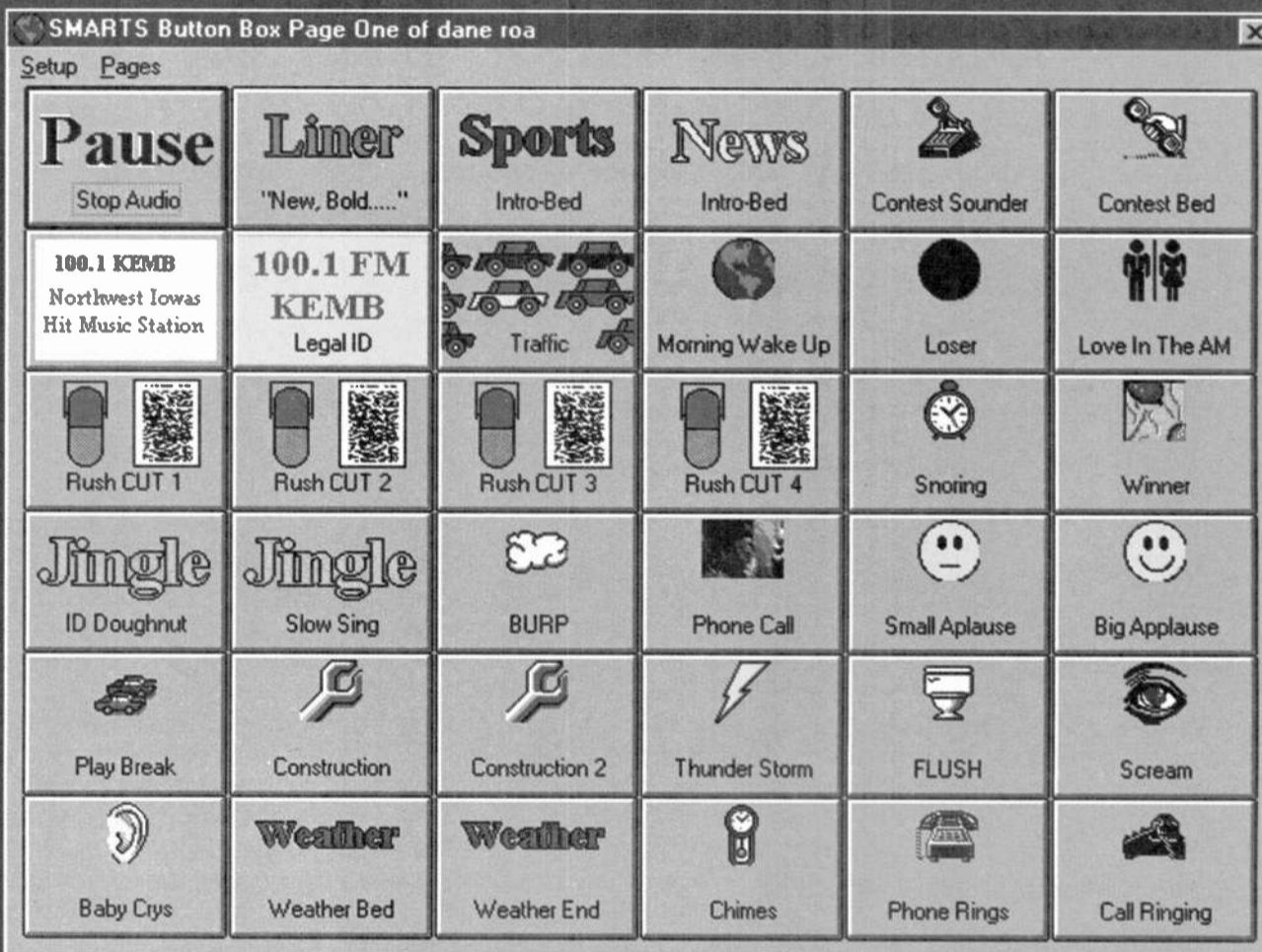
### Not a money machine

Many listeners are aware of the connection between the store and the station, and they sometimes offer programming compliments or comments while stocking up on batteries or blank video cassettes.

In some ways, the KPYP-Radio Shack combination is a throwback to the earliest days of broadcasting, when department stores and electronics firms would put stations on the air so people buying radios from them would have something local to listen to. "That's not why we did it," said Len, "but I think we've had a few listeners come into the store to buy radios that they then used to

See SHACK, page 34

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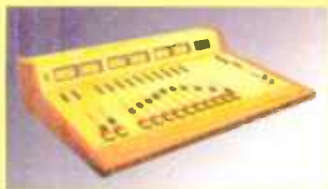
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# Cancer Talk in 'The Group Room'

Sharon Rae

Group therapy on a larger scale is the focus of a new radio talk show out of Los Angeles. Call it a network of support.

Selma Schimmel is the host of "The Group Room," billed as the nation's only syndicated, live call-in radio talk show for people dealing with cancer.

Schimmel is president of Vital Options, a nonprofit psycho-social support organization. She said her own experiences with cancer led her to develop the radio show.

"I was 28 when I was diagnosed with breast cancer," said Schimmel, whose mother, grandmother and uncle had all died from forms of cancer. "I had to fight very hard as my own advocate and had absolutely no role models for survival."

## Network support

Tim Kelly is the executive vice president and director of programming for the Premiere Radio Networks, the distributor and syndicator of "The Group Room."

"Cancer is a problem that's not going away," he said. "It affects everybody in the United States either directly or indirectly. One third of all people will have cancer, and if 33 percent of any group — such as the human race — has something, the other two-thirds are affected by it."

Kelly pointed to the emotional, physical, mental, and spiritual experience of dealing with cancer.

"Whether you are the patient, or the person who is supporting the patient, the experience is an extremely difficult one and you need all the help you can get."

Schimmel had great expectations for her radio talk show, which started at Vital Options as a support group in a conference room (the "group room").

"Looking at where health care is going

in the United States and the difficulty in fundraising, and how the needs of today's medical consumers are changing, I wanted to find a way to still help people for free, no longer limited by age, still on the national level," she said.

"I was reading an article about radio at



Host Selma Schimmel

some point and said, 'That's it! Why not take what we do at Vital Options with support groups and do a support group on the air?' And thus was born the idea of a radio talk show dedicated to cancer."

Joe Sibley is operations manager at WCUZ(AM) in Grand Rapids, Mich., one of 15 affiliates that carry the program.

"People are really turned on by this," he said. "We have received a number of positive comments both on the phone and also on our comment line."

She said people really appreciate the program. The show "makes them feel like they're not alone in dealing with the issues (related to cancer). There are enough people that have to deal with cancer that I think it touches almost everybody."

"This is not a depressing show," said

Schimmel. "Neither is it a petri-dish medical talk show. It is emotional, dealing with political and social issues.

"Obviously, people are calling to get simple medical information about treatment, but what's underlying every call is the emotional impact of the disease, and it's certainly not limited to the person with cancer. Our audience includes family members and friends."

Schimmel cited one program during which a 13-year-old girl from Texas called in.

"This little girl's aunt has breast cancer and this kid — at 13 — called to tell us that everyone should appreciate and value life because cancer is a really serious thing and life shouldn't be taken for granted. She was trying to give people an inspirational message about embracing life. So at 13, she got a piece of wisdom because her aunt is going through cancer."

## Tough sell

While Schimmel conceded the program is a hard sell, she also said the process of convincing program directors is an interesting one.

"The moment you say 'cancer,' the first reaction is 'well, this is going to be depressing.' To me, cancer is a metaphor, at least in my mind, for all the kinds of malignancies and challenges that people have to face in life. We as cancer survivors have so much that we can teach people about overcoming obstacles."

Schimmel said the show is as compelling as any psychology program.

Radio "has done political talk, we've done psychological talk ... it's now time

to do health care talk. We are a model to begin to teach patients, whether it's cancer or any other serious illness, how are you going to get your medical needs met in managed care?"

Tim Kelly agreed, and challenged program directors to show a little courage.

"Radio is the electronic backyard fence of America," he said. "With support systems dwindling because of the modern health care systems that are in place ... this is something that needs to be done."

**This is not a depressing show ... It is emotional, dealing with political and social issues.**

—Selma Schimmel

Schimmel also called the show an untapped source of advertising revenue for local stations. She said businesses such as HMOs, insurance companies and pharmacies are potential advertisers. And despite the subject, "The Group Room" can be very funny.

"Believe it or not, good things can come out of something as bad as cancer because it helps people come to grips with life," said Kelly. Human mortality "is the last great thing that we have not started talking about yet on radio and people will love you for wanting to help. It's such a positive image builder for the radio station."

"The Group Room" is heard on 15 affiliate stations in North America, including the CHUM Radio Network in Canada, and can be accessed live Sundays on the Internet at <http://www.premrad.com>

## KPYK-Radio Shack Combo

► SHACK, continued from page 31  
listen to KPYPK."

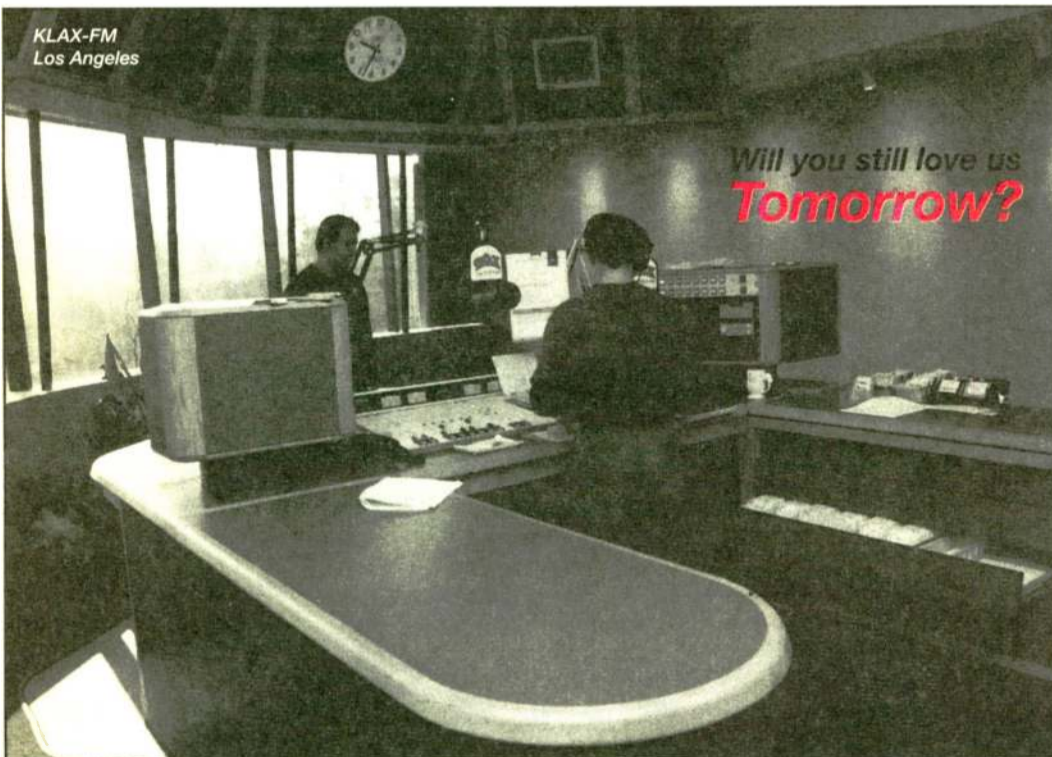
While the Radio Shack is a profitable concern, KPYPK, like its store-based ancestors, is not a huge money-maker. "We haven't really gotten to the point where it's making any money; we're about at break even," said Len, who handles sales. "That's the big problem. I don't have time to get out and do what I should because I'm tied up here a lot of the time." It is apparent that Len's major interest, after nearly 50 years in radio, is serving his audience; money is a secondary consideration.

"I'd like to keep this big band format going because it's appreciated a whole lot in this area, at least by a certain few. We're not serving as many people as we could with a different format, but this is something we like to do. We're still here after four-and-a-half years, so I feel like we've accomplished a little bit."

And at least Len can get a nice discount if he needs some audio cable or a set of headphones.

■ ■ ■

Lee Harris is morning anchor at all-news WINS(AM) and a former station owner. He is also president of Harris Media, a website design and hosting firm. Contact him via e-mail at [lee@harrisnet.com](mailto:lee@harrisnet.com)



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# Neat-O 1997 Web Sites

► CYBER-MUTT, continued from page 28

A nice sandwich — uh, I mean a nice *site* (must be lunch time or sumptin') awaits your eyes at <http://www.x107.com>. It's the brand-spankin'-new cyber-home for WRGX(FM), X-107 in Hawthorne, N.Y.

X-107 is one of those "Today's Rock" kinda stations, and you know it like you know nothing else upon hitting the first page. You'll find a colorful graphic with the names of some of the bands the sta-



tion plays, from Pearl Jam to Smashing Pumpkins to Stone Temple Pilots (what, no Johnny Mathis?). Oh, and you'll also find the station's colorful logo.

The colorful home page is nicely laid out against a black background. There's a whole lotta info here to peruse; the visitor chooses by clicking on one of the animated page names (a nice touch, by the by): everything from music news and a list of area concerts to a message board ("the X-change") and the "Dirty 30 Countdown," based on listener requests.



There's also a place to enter requests.

One of the neat and clever doo-dads on this site is the banner that sits on the bottom of each page: You see a station van and the message "Click on Van to drive back to X-107 X-Site Main Menu." When you click on the van, you find yourself back on the home page. Talk about travelin' in the fast cyber-lane. Cool!

Great job, and the very first Neat-O Site of the Month in 1997.

## Now, the second one!

Here's the very second Neat-O Site of the Month in 1997. Hey, they're both good! And I'm feelin' generous!

WRNR-FM, beamin' outta Annapolis, Md., is on the Web at <http://www.wrnr.com>. It's progressive. It's free form. And it's pretty cool. Check out the smart lookin' home page with the smart buttons that lead to lotsa info on the station.

Check out the RealAudio 3.0 signal, soundin' about as good as it gets! Check out the little-bit-o'-this, little-bit-o'-that playlist — from Billy Bragg, Marshall Crenshaw and Maria Muldaur to Jason Falkner, Marti Jones and the Squirrel Nut Zippers.

Hey, just check it out — check out the very second Neat-O Site of the Month in 1997 and the new year's very brand-spankin' first Neat-O Live Broadcaster Site of the Month.

## Arf!

Welcome to the first, gonna-appear-every-so-often "Poochy's Pick," Poochy the Cyber-Mutt's site of the month (since

I'm only going to let Poochy in this space a paw-ltry coupla times a year, maybe it should be his "pick of the every-so-often"). Anyway, here's Poochy (watch him type — it's somethin' else):

Bark, bark! Arf, arf! Howdy hello! It's me, Poochy the Cyber-Mutt, with my "Poochy's Pick." And don't you believe otherwise — I picked it myself!

While surfing the Web, I pawed a spell at the Web site of WHTC(AM) Holland, Mich., which calls itself Holland's Hometown Radio Station. The URL is <http://www.whtc.com>. I dug the home page, which features a barkin' good-lookin' remote control that takes you to station information, national and



local news, and more.

This site gets four out of five barks and my personal paws up! And now, back to my buddy, Mr. Haberspace.

Thanks for stopping by with your very first pick, Poochy.

Now, get back to your doggie bed and count dog bones!

A few more things before I make tracks. Kudos to the folks at National Public Radio for their cool, redesigned site, available for viewing at <http://www.npr.org>.

The home page has a neat analog clock

(complete with second hand) next to the familiar NPR logo, links to news on the hour, a program list with links to info, and discussion boards on which listeners can chat about this and that.

I like it and you probably will, too.

Time to get crackin' on next month's Space. Don't forget to send me, by e-mail, news on your station's cyber-doin's.

The address, as always: [zoogang@earthlink.net](mailto:zoogang@earthlink.net). I'd especially like to hear war stories from stations that have been broadcasting on-line for a short time.

Tell us about your experience.

Meanwhile, fingers to the keyboard, as they say. Oh, oh ... the mail guy with the dandruff problem is on his way up the cyber-walk. Hey, Poochy: get the cyber-shovel!

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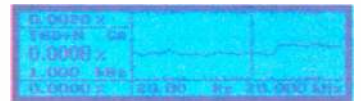
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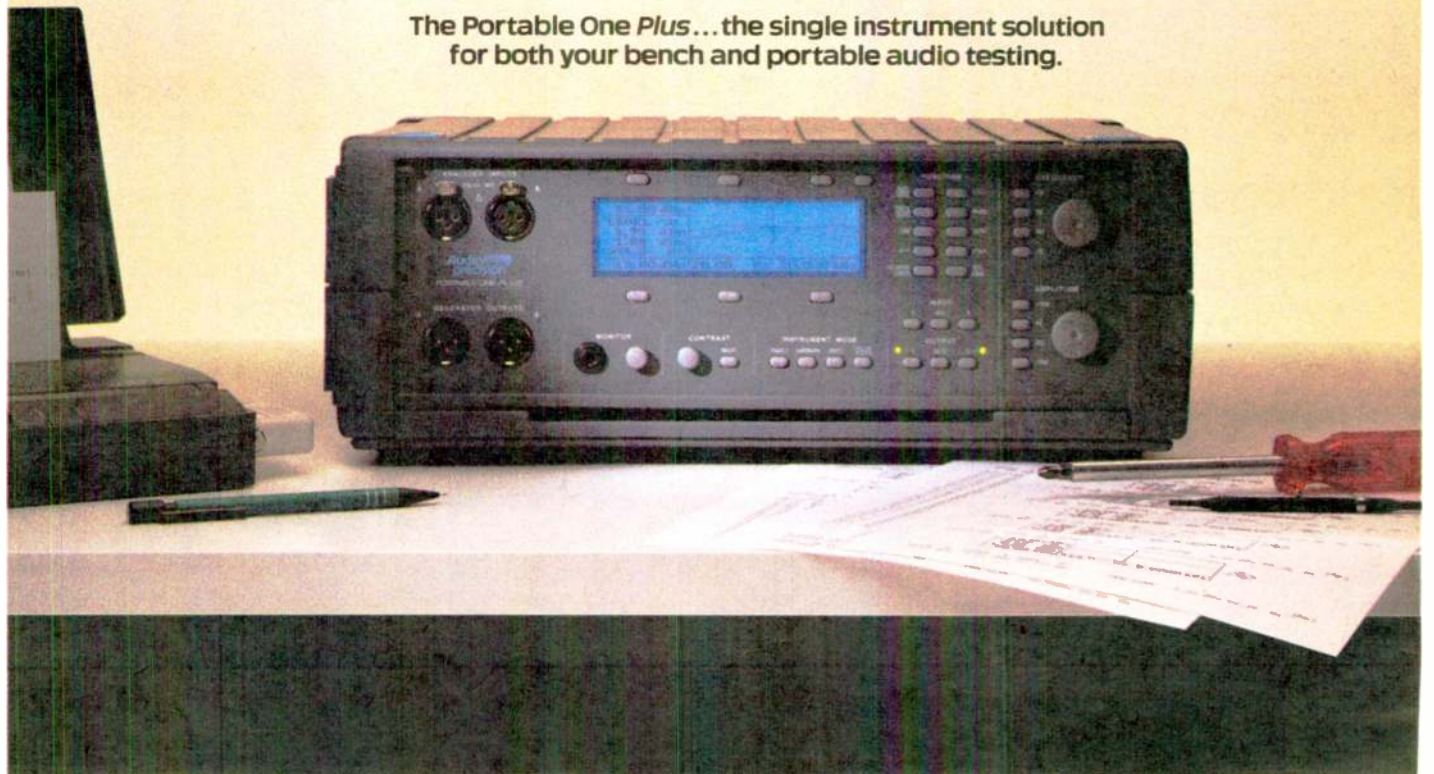


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PROMO POWER

# Shatter Assumptions to Succeed

Mark Lapidus

"Our listeners won't tolerate loud commercials. Everything we get from agencies has to be recut in a low-key style so that commercials won't interfere with our classical music presentation. Musically, our listeners won't stand for those short pieces that many other classical stations play. And we use almost no processing on our signal because our listeners want a full-fidelity experience."

Not long ago, most general managers at classical music stations were chained by such self-imposed concepts. They were gradually emancipated by increased

competition, experimentation and — most importantly — research.

## Compete and experiment

**Competition:** The buying frenzy has led companies to spend incredible amounts of money for stations. Ultimately, this filters down as pressure on sales staff to hit higher numbers. Meanwhile, other stations in your market sound better than ever and are dropping their rates to get business. You have no choice but to become better at what you do, too!

**Experimentation:** To become a better radio station, question the many assumptions you make about what your audience

wants. Which of these assumptions are inhibiting your growth? If you can, find completed research on the subject. If not, you may have to experiment.

For example, when classical stations began to process their signals so that low musical passages could be heard in cars, not only did they lose few fans, but they gained many more. This move required some risk. I know it sounds silly now, but don't forget that most people assumed full fidelity was required to generate the most classical music fans. At some point a brave manager had to say, "But they can't be fans if they can't even hear it." Another manager concluded that long

pieces in drive times weren't working; commuters wanted to hear an entire work rather than parts of long pieces. In addition, this was hindering her ability to sell the units needed to make budget. These gambles worked. Ratings and revenue have gone up for many classical stations that have moved in this direction.

## Gut, plus

**Research:** No question, "gut feeling" is important to decision making. But gut feeling and the use of research input need not be mutually exclusive. Begin by using all available research. Many stations have already paid for psychographic research for the sales department, but frequently programming and promotion never get around to looking at it.

This information can tell you **how** many in your target audience are **mar-**ried; how many concerts they attend **per** year; how many live in homes vs. apartments; how much they earn; how many are handgun owners and credit card loaners; and how many use the Internet.

Step two involves *asking* your audience. Your first choice is to select a reputable research company that can customize a plan to meet your needs. If budget constraints limit the research, you *must* tackle this area yourself. Don't eliminate research simply because your budget is busted. Start talking with your own listeners. These are people in your target demo who can give you the keys to attract others. They like you ... that's why they listen! Interestingly, they may like you for unexpected reasons.

This "listener conversation" begins with a simple questionnaire that you can hand out at your events, place on your web page and send to people in your database. (Have you used your 800 number in the control room to reverse-match and build that database? It's cheap!)

Here's a brief list to ask about: A) Morning show B) Your music C) A mix and match of your slogans and those of your competitors to see what your audience remembers. D) Your major programming features. For example, does your "ten-in-a-row" mean anything to them and do you get credit for it? E) Your off-air advertising. Have they seen or received anything from you or one of your competitors? F) Your special features, like syndicated shows and weekend themes. G) Your DJs against your competitors' DJs. H) Who they like and dislike, and why.

While this is certainly not a statistically sound approach, such information is still enormously valuable. Look for the trends. If the majority of a few hundred listeners hate your morning show, you know it requires attention!

Some program directors will argue that information from current listeners is far too biased in a station's favor. If you're skeptical, try looking at it this way: Most stations involved in blind research, in which the participant has no idea which station is conducting it, still use a "screener," a set of criteria used to obtain your research audience. When you talk with your current audience members, they too meet all these criteria. They may like you more, but few people listen only to one radio station. It's no accident that car radios have a lot of buttons!

Mark Lapidus has held positions as corporate vice president for marketing, program director, promotion director and DJ. Contact him at (703) 764-3994 or send e-mail to lapidus@erols.com

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# Studio Sessions

Sound Forge 4.0  
Is Here  
See page 38.

Radio World

Resource for Radio Production and Recording

January 8, 1997

## Alien Attacks and Gothic Halls: The ProR3

Tom Vernon

I can still remember my first experience with a reverb unit. My college station had a Fisher Space Expander installed in the production room.

This was an electromechanical device with vacuum tubes, intended to add a concert hall effect to recordings of classical music.

The Space Expander was not as elegant as professional gear, but it enabled us to create those Boss Jock promos that were the staple of Top 40 radio. For special effects with reverb, we used to beat on the side of the rack where the spring unit was mounted.

Times have definitely changed since my college days, and today's production techniques with reverb are a bit more sophisticated.

### On the edge

At the cutting edge of '90s reverb technology is the new Yamaha ProR3 Digital Reverberator, a box that may be equally at home in the recording studio or production room.

Its 32-bit digital signal processing and 20-bit linear A/D and D/A converters deliver a startlingly clean sound.

The Reverberator's carefully crafted analog circuitry permits a 110 dB dynamic range with natural reverberation and a noiseless decay.

Mechanically, this Yamaha is a sleek, black 1U high rack-mount device. Front-panel indicators include an eight-segment stereo level meter, a program number display and a backlit LCD panel that displays the name of the program selected, program parameter values and various status/error messages.

There are controls for the pre-effect three-band parametric EQ, keys to select effects parameters and Data keys to modify the value of the selected parameter as well as access the three-band post-effect equalizer. An Infinite key allows you to create the noted 'stop-motion' sound effect.

Around back, the ProR3 has five-pin DIN connectors for MIDI In, MIDI Out and MIDI Thru.

Balanced stereo inputs and outputs are provided from XLR and quarter-inch phone jacks.

Level select switches allow you to change the nominal input and output levels between -10 and +4 dB.

The ProR3's published specs are a bit conservative.

Our unit exceeded all performance specifications. Frequency response was

flat from 20 Hz to 20 kHz, plus or minus 0.5 dB. Noise measured -90 dB. Distortion at 1 kHz was an impressive 0.005 percent at maximum level.

Under time pressures, there was a tendency to just use the 'Small Hall reverb' setting, as this is a good generic effect.



The Yamaha ProR3 Digital Reverberator

The ProR3 has 10 primary effects: reverb, early reflection, room simulation and combinations of echo, chorus, flanging, pitch change and audio pan. Following reverb, you can further refine your effects with a dynamic filter, compressor, EQ, gate, level and balance controls.

Stored within the ProR3's firmware are 90 preset programs such as: Large Hall, Gothic Hall, Power Drum Room and numerous gate and effect reverb offerings.

If you cannot find the effect you want, do not worry; there is room to store 90 of your own effects along with those provided by Yamaha.

No World Cafe equipment evaluation would be complete without a peek under the top cover.

The ProR3 looks more like a computer than a piece of sound gear. All connections to the main PCB are made via connectors. Removal of this board should not be a problem.

The main circuit board is populated with both socketed ICs and the surface

mount variety. Quality of construction is quite good.

The 37-page owner's manual takes you through installation, using preset programs, creating your own programs, using utility functions such as MIDI and error messages you may encounter from the ProR3 display panel.

It includes screen shots of the display panel and block diagrams to show the Reverberator's internal functions. Reading it should enable anyone from novice through expert to make a smooth launch.

On a disappointing note, no service manual is provided with the unit. Since I have not seen Yamaha's tech manuals, their quality is an unknown to me.

Our torture testers, Chris and Joe, enjoyed the versatility of the unit, but felt the learning curve was a bit steep. You need to spend some time both experimenting and reading the manual to reap all the benefits the ProR3 has to offer.

### Curious connoisseur

If your needs are simple, such as concert hall reverb, this box may overwhelm you. If you are a connoisseur of special effects or have a curious nature and the time to indulge it, then the ProR3 may provide a vast playing field for your creative energies.

Special thanks to Chris Williams and Joe Taylor of the World Cafe, who never knew the joys of slapping the spring box to get the 'wah wah' reverb effect.

■ ■ ■

For information, contact Yamaha at (714) 522-9011 or circle Reader Service 58.

Tom Vernon divides his time between consulting and completion of a Ph.D. You can e-mail Tom at TLVernon@aol.com or call him at (717) 367-5595.

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# Sound Forge Gets Better

Read G. Burgan

Just when you thought it doesn't get any better, Sonic Foundry has released the next version of Sound Forge 4.0.

Sound Forge 3.0 has justifiably won widespread praise as one of the most powerful PC-based digital audio editing software. I expected only minor changes and additions in the next version, but Sound Forge 4.0 is a major improvement to an already great software package.

I will not even try to run through all of the new features in Sound Forge 4.0. Instead I am going to share my favorites. If you want the whole scoop, download a demo from Sonic Foundry.

One of the first new features that greets the user of SF 4.0 is a new bargraph Play meter that becomes a Record meter in Record mode.

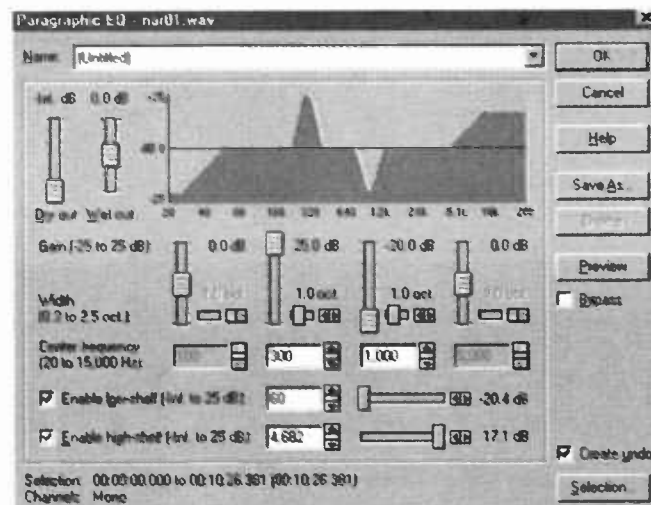
In the earlier version, the increments were too squashed to tell just how close I really was to 0 dB during recording. Right-click this meter and set the range as wide as 90 dB or as narrow as 24 dB. The meter reacts fast and holds peaks until reset.

SF 4.0 now reads the wave screen time display as HH/MM/SS. Version 3.0 read seconds only, which got cumbersome with a figure such as 742 seconds. I really appreciate the ability to read the time out the way most of us do it in real life.

Nice change.

The screen display now scrolls as a soundfile is played. Slower PCs may not be able to process the material fast enough to support this feature, but you can turn it off if necessary. Multiple Undo/Redo levels are now available. You do not have to start all over when a project goes wrong. Just access the Undo history and go back to the point where your production went awry.

SF 4.0 sports a new, simpler-to-use reverb with better quality than the earlier version. It includes Dry



The Paragraphic EQ Screen of Sound Forge 4.0

Out, Reverb Out and Early Out sliders.

Settings are available to emulate plate, bright halls, medium rooms and the like. For those of us who still like some of the features of the previous reverb, they are still available under the Delay/Echo submenu.

Need a compressor/expander? SF 4.0 has completely changed its approach to this function with its Graphics Dynamics function. When you open the submenu, you get an x/y graph. This takes a little getting used to.

Normal gain is represented by a 45-degree line running from corner to corner. The vertical axis represents dB out; the horizontal, dB in.

Want to compress, expand or gate your signal? Any portion of the line above the axis will raise the gain at that level, and any portion of the line below will compress. Sound complicated? Just play around with it for a few minutes.

As with other compressor/limiters, you can set the attack, release, ratio and threshold levels using an on-screen slider.

Also under the Dynamics menu is a Multi-band Dynamics function. It allows you to apply compression and limiting to up to four frequency bands. This deals effectively with soundfiles filled with plosives or sibilant sounds.

The four bands can be low-shelf, high-shelf or band-notch filters. Threshold, attack, release time and frequency can be set independently for each filter band. A 'Get Threshold' button evaluates a soundfile sample and gives you a starting point ... easy and effective for eliminating pesky pops and 's' sounds.

The Dynamics tool also eliminates annoying stylus thumps on a severely warped record. I like this feature a lot.

## Video Clips

Another nice new feature of SF 4.0 is the use of video clips for demonstrating processing features.

To access a clip, select Help for a particular feature. If there is a video clip for that feature, the option will show up in green at near the top of the help menu. These are genuine multimedia video clips that explain basic concepts for a particular function, then demonstrate it on screen.

My only criticism is that not all processing functions have video clips, and some could use additional detail. But they are a fast way to familiarize yourself with new features.

Where SF 3.0 had both a graphic and parametric equalizer, SF 4.0 adds a Paragraphic EQ. Essentially a parametric equalizer, it gives a graphic representation of the frequency changes as you move the sliders up and down and the octaves wider or narrower. It includes both a high- and low-shelf.

See FORGE, page 40 ▶

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



DN-2000F MKII Double CD Player

# The New Sound Forge

► FORGE, continued from page 38

The algorithms used to achieve the paragraphic EQ are great, and this is a feature that sounds as good as it is easy to use.

Sonic Foundry has also revamped the Normalize function. Before you had just one option: to normalize or not?

Now you have choices that include normalization on the basis of peak levels or average rms. You can adjust the scan setting to ignore information below a certain level and set normalization output to any level you like. This is one improvement you will want to play with; it will determine not only how loud your peak level will be, but how

dense the final sound will be.

SF 4.0 has also added an interesting Pan/Expand function. Access this feature and witness a screen representing the stereo image with left, center and right imaging along the x axis and the sound file itself along the y axis.

How you drag the envelope on the screen determines whether your stereo image is widened, narrowed or panned from left to right. If you have a recording mixed with an M/S mic setup, you can convert it to a true left/right mix.

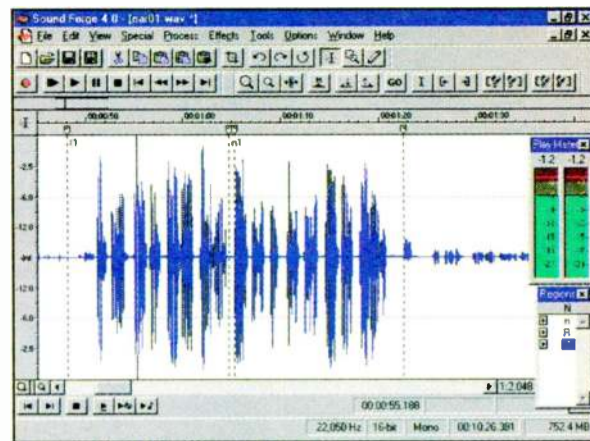
Caution: Pan/Expand works only with true stereo recordings. It will not create a stereo mix out of a mono recording. Do that with 'Channel delay for stereo

simulation' under the Delay/Echo menu.

The new Pitch Bend function is graphically laid out as well, with the pitch change function on the x axis and the sound file on the y axis. Move the envelope to change the pitch.

The degree of change is registered in semitones on the graph and you can change the range of the settings. Change the pitch of the entire section of soundfile or vary it up and down along the soundfile according to how you set the envelope. It works very well and could not be easier.

Do not use the Pitch Bend function right away, however. When I tried it on a



The Main Screen of Sound Forge 4.0

soundfile, it obliterated the remaining portion in a fraction of a second. Sonic Foundry discovered a bug in that function and will remedy it in an update.

What sets Sound Forge apart from much of the competition is its modular design. Both Sonic Foundry and other third-party vendors are developing additional plug-in modules.

Sonic Foundry currently has three plug-ins: Noise Reduction, Spectrum Analysis and Batch Converter. I have discussed the Noise Reduction and Spectrum Analysis plug-ins in previous articles; if you are working with vinyl recordings or recordings with various kinds of noise, the Noise Reduction plug-in is effective.

The Batch Converter allows you to group together functions you commonly use on similar kinds of files. For example, if you use a particular EQ, compression/expansion setting, noise gate, noise reduction, reverb and normalization setting with certain sound files, you can create a batch file that will apply all of these functions to the sound files you select.

This will run each function in the order you select and save the file to any name you choose. Run the batch converter on as many sound files at a time as you want. This can save an enormous amount of time and allow you to be off doing other things while your computer does all of the hard work.

Both K.S. Waves and QSound QTools have plug-ins available for Sound Forge 4.0, and more are on the way. Your investment will not be a dead-end but will be state-of-the-art for many years to come.

There are a lot more features I have not touched on, and update 4.0a is due out soon. This will contain more, including support of RealAudio 3.0.

All of my testing was done using Windows 95 on a Pentium-100 with 16 MB RAM and a 686-133 with 32 MB RAM. Sound Forge will also run on Windows 3.x.

Sound Forge 4.0 comes on a CD-ROM, as do each of the SF 4.0 Plug-Ins. SF 4.0 has a suggested retail price of \$495. A Sound Forge Plug-In Pack containing the Noise Reduction, Spectrum Analysis and Batch Converter is available for a suggested retail price of \$495. Each Plug-In is also available separately.

■ ■ ■

Sonic Foundry is at 100 South Baldwin, Suite 204, Madison, Wis., 53703. Call them at (608) 256-3133, check out their home page at <http://www.sfoundry.com> or circle Reader Service 63.

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

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## PRODUCER'S FILE

# Turn Down the Effects, Will Ya?

**Ty Ford**

My e-mail box has been filling up lately with production kvetches. I do not know why I have been honored by being made town crier for production laments, but with the honor comes the burden of responsibility.

For the record, nobody is more passionate about production than I am. But the audio processing effects used in production have to benefit the spot, not hijack it. If your message is so weak that you feel the need to "punch it up" with over-the-top production effects, there is something wrong with the copy or what it offers.

Remember the Golden Rule of Schlock: "If you do not have anything worth saying, make sure you say it loud, fast and as many times as possible."

## Crank the echo

Anyway, it seems as if some of us may be overdoing it with the effects boxes again. You can tell when a radio station gets a new effects box. They frequently overuse the bejeebers out of it.

I am talking about the gratuitous use of echo, reverb, voices pitched up or down and Max Headroom stutter effects on every spot and promo. This is a flagrant sign of an out-of-control production department.

Sure, you might argue that the listeners' attention needs to be ... er ... "stimulated" this way. After all, sound designers for film and TV are using atomic bomb explosions and lightning strikes as part of .38 caliber pistol discharges. Why should they have all the fun?

So okay, if hyperbole is justifiable, then we get into *intent*. What effect did the production person *intend* to communicate? Was their intention the result of good judgment, or did they blow it? There is no way of really knowing.

It is ultimately unfair to say that just because the event happened on a small-market station, it must have been made

by someone who did not know any better. This can be only a mental exercise, but hopefully one that makes you think.

The next time it occurs to you to reach for that slap echo, double-backswirl phaser panner, ultra-funky EQ or cathedral reverb ... count to 10, back off the caffeine and put yourself in the listeners' perspective.

They will not appreciate the reverb trails on Program 6, Bank 2 of your new Reverb Thingee. Ultimately they are listening for entertainment and information and whatever other content they may consider valuable. That is because radio is in the Mood Service Industry. It services the moods of its listeners.

## Too big

Another kvetch pointed out the seemingly inappropriate use of an effect, like using a huge hall effect where simple room ambience is called for.

Again, because the effect used was greater than what would normally be heard, this seems to fall into the Turn-It-Up-To-11 school of production. We do not know the intent of the person behind the controls. Did they purposely "miscast" the space, did they not know how to create the correct space, or did they simply not have

**Good production effects work best when used as subtle underpinning.**

an appropriate ambience in the box?

Good production effects work best when used as subtle underpinning. When you use over-the-top effects to get somebody's attention, your content had better be as important as the effect is prominent, or your listeners will soon peg you for what you really are: desperate.

Is the kvetching coming from traditional radio people — old-timers, if you will — who just do not get it? I don't think so. I think we can all improve our production chops.

Maybe if more production people started thinking in more subtle shades ... well, they would likely be clubbed over the head by the sales department as if starting in some old Three Stooges routine.

See, part of the problem is that a lot of radio gave up on "subtle" a long time ago. That is why so many on-air people still sound like Ron Radio.

If you want to point your finger at a problem that plagues radio, there it is. And it has been going on since the Drake days of radio in the early '60s. If you disagree, you are in denial. As proof, I offer that when comedians start riffing about how affected DJs sound, it is time to face the truth.

If you have a gripe, let me hear from you. Constructive criticism is as important as more positive reinforcement. And as audio purists point out, negative feedback *does* increase fidelity, right?

We will wait until enough spleens empty out and the mailbag fills up, then jump on another rant.

■ ■ ■

Ty Ford's "Advanced Audio Production Techniques" is available from Focal Press. Download his voice demos from FTP.Jagunet.com/pub/users/tford

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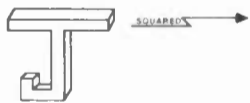
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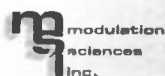
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# PRODUCT GUIDE

Companies with new product announcements for Studio Sessions Product Guide should send them to Radio World, c/o Studio Sessions Editor, P.O. Box 1214, Falls Church, Va. 22041



## Valentino Releases on 'net

Thomas J. Valentino Inc. now makes its Music and Sound Effects libraries available as files that can be downloaded via bitstream technology over the Internet. Interested users can find details on the company's website, [www.tvmusic.com](http://www.tvmusic.com)

The Valentino production music and sound effects CD library has also been expanded to include two new volumes. The Music series is now up to Volume 95 and features a collection of musical IDs and logos. The Sound Effects series has been expanded to Volume 54, with new recordings of contemporary office equip-

ment including fax machines, copiers, computers and cellular telephones.

Sound effect CDs are \$40 each and music discs are \$20. Music clearance charges are extra.

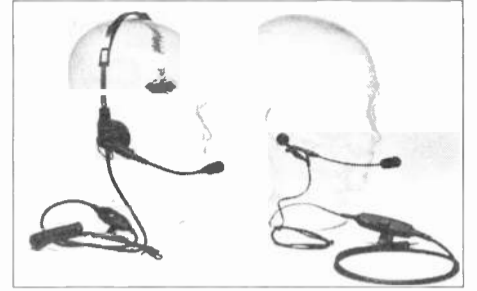
For information, contact Valentino at (914) 347-7878 or circle Reader Service 3.

## Motorola IFB Headset Mics

Motorola introduced two new lightweight portable mic/headset combinations, designed for non-broadcast communication. While originally designed for the Motorola line of two-way radios, these headsets are

appropriate for talkback between producer and studio in remote situations.

The Lightweight has an adjustable head-



band and a single speaker that fits comfortably on either ear. The Ultralite headset has an under-ear counterbalance to offset the small foam in-ear transducer. Both mics have a push-to-talk switch and clothing clip, and are compatible with most Motorola portable two-way radios.

For information, contact Motorola at (847) 576-1000 or (800) 247-2346, or circle Reader Service 53.

## New DOD Equalizers

DOD Electronics debuted three new Constant Q equalizers, making five total in its SR Series.

The newest DOD EQs include the single rack-unit, dual-channel, 15-band SR430Q (shown), the 1U mono 31-band SR431Q and the 2U mono 31 band SR831Q.

Each offers up to 12 dB of boost/cut per band with low-noise pots, and up to ±12 dB of overall level control is available to compensate for gain changes. Switchable 12 dB/oct low-cut filters are offered for



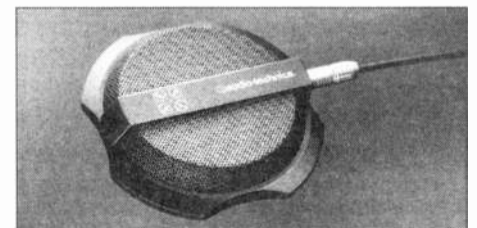
each channel and electronic filter switching minimizes transient pops and clicks. Each filter has a constant Q bandwidth for even response at any setting.

All three EQs have balanced XLR and unbalanced quarter-inch connectors, a rugged steel chassis, a THD of less than 0.004 percent at 1 kHz and a signal-to-noise ratio of 106 dB.

For information, contact DOD Electronics at (801) 566-8800 or circle Reader Service 57.

## Audio-Technica Quad Mic

The new Audio-Technica AT854R multi-channel boundary mic is ideal for audio and video teleconferencing and "round table" talk radio broadcasts.



The low-profile mic housing contains four cardioid condenser elements. When properly positioned around talk talent, the directionality of each element is increased by 3 dB. The boundary design minimizes phase distortion normally caused by reflected sound energy.

The AT854R is most effective when combined with an "intelligent" mixer to control mic levels, such as the company's AT-MX341a SmartMixer.

For information, contact Audio-Technica at (330) 686-2600 or circle Reader Service 28.

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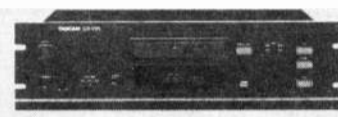
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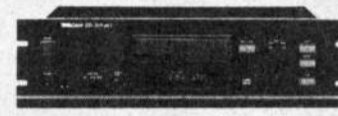
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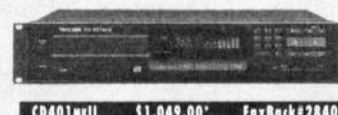
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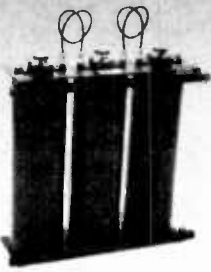
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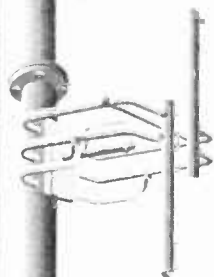
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# Buyer's Guide

Radio World

Test & Monitoring

January 8, 1997

**USER REPORT**

## RF Compliance Easy With Narda

by **Richard A. Tell**  
President  
Richard Tell Associates

**LAS VEGAS** Conducting field measurements for evaluating compliance with the new FCC RF rules on human exposure can be a pain when working at multitransmitter antenna sites. Two principal factors are related to the degree of effort required for meaningful compliance measurements: Maximum Permissible Exposure (MPE) limits in the rules depend on frequency and the MPEs are spatially averaged field values.

A new broadband field probe from **Lockheed Martin Microwave-Narda** and the Narda Model 8718 survey meter now make easy work of these measurements.

**FCC compliance**

The new probe, the Model 8742, has a built-in frequency response that follows the new FCC RF limits for occupational exposure across the spectrum from 300 kHz on the low end to 2.7 GHz on the top end, making this probe perfect for almost all complex, high-density broadcast sites.

With the inherent ability to weight measured RF fields according to the specifications of the FCC RF rules, the user no longer need be concerned about the presence of different transmitters operating on widely different frequencies. This typical situation has made it virtually impossible to carry out accurate field surveys at sites having a combination of VHF and UHF emissions with the more commonly available flat response probes.

Let us take a practical case. The FCC MPE for FM broadcasting is a plane wave equivalent power density of 1 milliwatt per square centimeter ( $mW/cm^2$ ). But at UHF TV channel 36, for example, the MPE is less stringent at a power density of  $2 mW/cm^2$ . If we add in a few high-power pagers in the 900 MHz range where the MPE is  $3 mW/cm^2$ , a simple measurement of the aggregate power density of all the fields with a flat response probe simply cannot always answer the question, "Is this site in compliance?"

The problem is that we do not know the relative contributions of the various contributors to the aggregate power density and, since the permitted level of exposure is different at each frequency, there is no way to know what number to compare our aggregate power density value.

The new Narda Model 8742 frequency-shaped probe solves this problem by appropriately weighting the field levels at each frequency according to exposure limits and presenting the result in terms of a percentage of the MPE. The field survey engineer can concentrate on

important results, rather than worrying about how to get the stations to shut down for our measurements so we can determine their contribution to the aggregate fields.

This becomes particularly troublesome since it means that multiple, detailed surveys of the site must be accomplished with accurate, time-consuming documentation, measuring field level at every point with each transmitter operating separately, while also contending with the often lengthy negotiation process for getting the stations to cooperate. No more of this hassle with the 8742. No transmitter shut down is required for performing the compliance study. All that is required is a careful search of the site for those areas that may exceed 100 percent of the MPE as indicated on the LCD display screen of the 8718 meter.

Now what is this business about spatial averaging? The MPEs in the new FCC rules are based on the rate at which RF energy is absorbed throughout the body

or the so-called whole body average energy absorption rate. The MPEs represent those values of fields as averaged over the body dimensions, not the spatial peak value that might be found at a singular point during a field survey.

**Spatial averaging**

This is extremely important since in the past the approach most commonly taken during RF compliance measurements was to focus on whether one small spot exhibited high fields that might exceed the MPE.

Just because you may find an area that indicates strong fields that exceed the stated MPE, this does not necessarily mean that the area is actually out of compliance; a measurement of the spatially averaged fields is now required.

If, after performing the spatial averaging measurement, the MPE is still exceeded, then there is a compliance issue that needs to be addressed by the various contributors at the site.

One of the powerful attributes of the 8718 digital meter is its measurement of the spatially averaged RF field expressing it as a percentage of the MPE. In an area where the spatial peak field exceeds 100 percent of the MPE, a few key punches on the 8718 bring it up in the spatial averaging mode of operation.

Upon triggering the measurement process, the probe is moved slowly along a vertical line corresponding to the standing axis of an individual. At completion of this vertical scan, the measurement process is terminated by pressing the meter key. The meter instantly indicates both the spatial average value appropriate to the measurement location, as well as the spatial peak value determined during the vertical scan of the probe.

By acquiring multiple measurements in the areas of concern, you can arrive at a technically supportable conclusion as to site compliance. Having the ability to check spatially averaged field values conveniently will likely result in far fewer instances of site RF compliance problems.

For more information from Lockheed Martin Microwave-Narda, contact the company in New York at (516) 231-1700; or circle Reader Service 43.

**USER REPORT**

## Dorrrough Test Set Sets Standard

by **Joe Sidore**  
Senior Digital  
Mastering Engineer  
Warner Bros. Records

**BURBANK, Calif.** To the best of my knowledge, **Dorrrough** metering systems have been in existence for over a decade. I have been using a variety of **Dorrrough** metering units for most of that time in a mastering environment at Warner Bros. Records.

One of the most valuable instruments from the **Dorrrough** line is the stereo Test Set 1200. It features two high-resolution LED meters, system gain measurement, L/R polarity and phase compatibility. It can also analyze stereo signal integrity, system noise floor, cross-talk and record/playback azimuth adjustment. The test set was not created solely as a passive readout for the audio technician.

**Real-world test**

The **Dorrrough** Test Set 1200 should not be relegated to the lab or the test bench; it is a real-world tool for the studio. The 1200 reprocesses stereo program where there are no multitracks in existence, and deals with improperly mixed older "one of a kind" recordings.

One of the tragedies of poorly mixed older material, and also modern, overly "correlated" recordings, is a lack of dimension. The complex phase relationships some engineers are micro-

managing and eliminating provide a sense of place and depth. The **Dorrrough** Test Set 1200 offers a simple method of monitoring these phase relationships.

Try this technique utilizing four mixer channels to restore some feeling of reality to flat recordings. Run stereo program into the 1200 and bring the program up on two faders panned left and right. Connect two additional faders, designated sum/difference (pan pots set to the "center" position) to the special L/R-S/D monitor output on the rear of the 1200.

The audio product at this two channel output is directly controlled by the stereo-sum/diff (phase) function switch position. Limited space here precludes full descriptions of hook-up and specific pin connections, but **Dorrrough** will provide the details.

Then play the program material,

have increased the level of the panned material to a satisfactory level, you may find that the bass is attenuated. Introduction of the sum fader can solve this problem.

Arriving at a suitable end-result requires some patience and practice. As long as you understand the process, the Test Set 1200 will make the perfect tool for the job. You may ask, "What is my program material going to sound like if I play it in the monaural mode?" Although mono is hardly the main concern, surprisingly the effects of sweetening adjustments have even carried through to the monaural environment. For the purists out there, it is true that introducing the sum or difference into the mix will alter phase relationships, but that is the idea.

**Trust your judgment**

As long as your adjustments fall within the 6 dB window, they should not detract from the integrity of the original recording. Good judgment is everything. The positive effects to your program material will outweigh any negatives.

**Dorrrough** metering systems are designed to perform a specific function; whether analog or digital, they perform to a high degree of accuracy.

For more information from **Dorrrough**, contact the company in California at (818) 998-2824; fax: (818) 998-1507; or circle Reader Service 47.



Dorrrough Stereo Test Set

adding a little of the difference fader to the mix. Depending on whether or not the difference fader is switched in phase (stereo) or out of phase (sum/diff), the level of the "sides" or "panned" material can be controlled when raising or lowering the fader. In some ways, it will add depth. Once you

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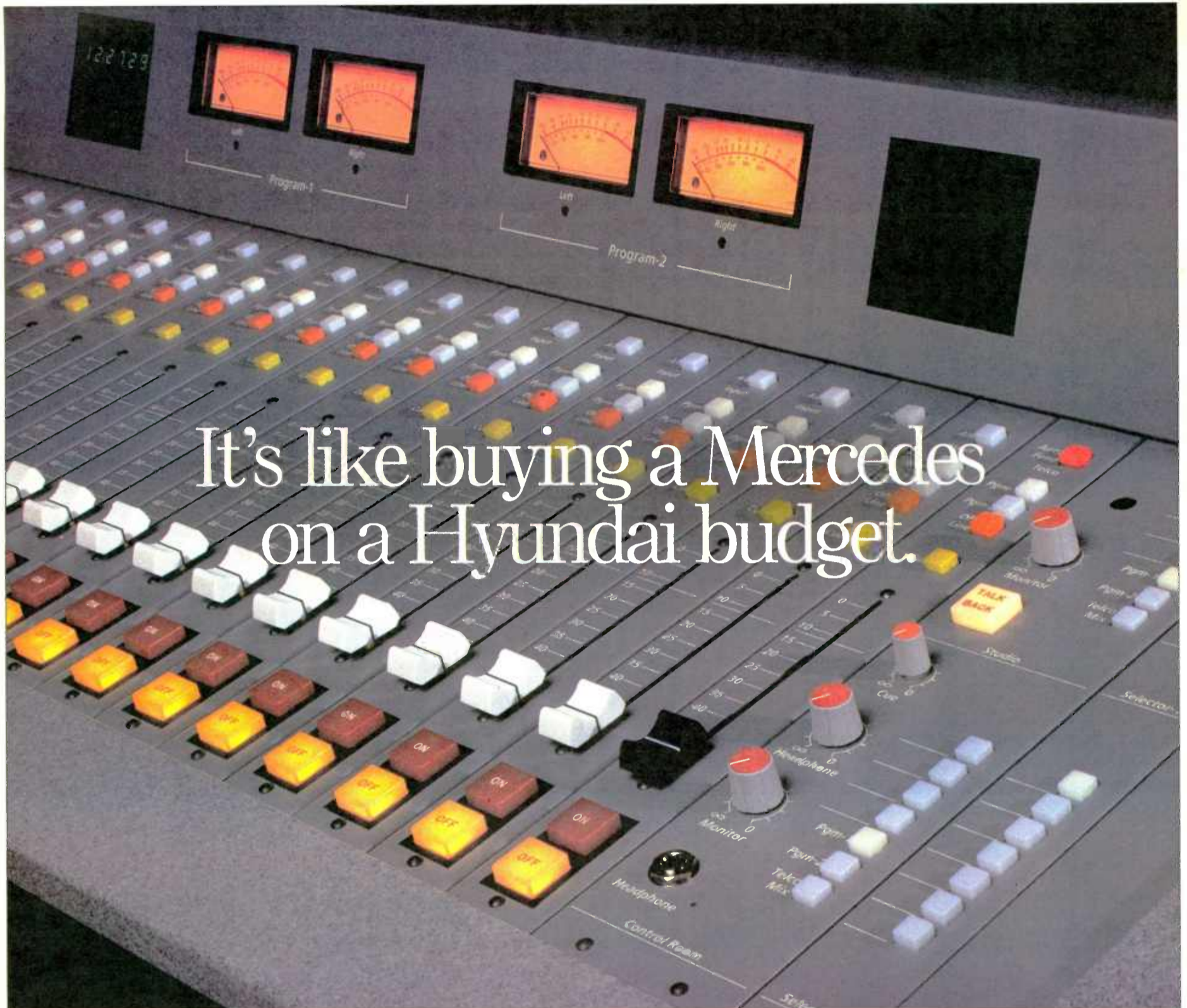
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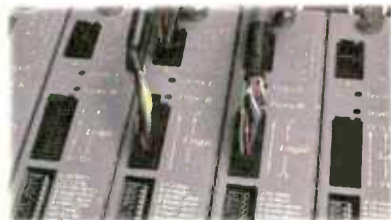
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SPECIAL REPORT

# Dove Improves, Builds Upon H&F Base

**SAN LUIS OBISPO, Calif.** On Dec. 31, 1995, **Dove Systems** acquired the product line of Hallikainen & Friends, a company manufacturing transmitter control equipment since 1978. Dove Systems is a manufacturer of lighting control equipment for the television and entertainment industries.

Dove Systems provides support to existing H&F users and is improving upon the existing product line to better suit the changing broadcast industry.

The Dove Systems transmitter control product line includes the TEL171 digital update kit for the Moseley TRC-15A remote control.

The TEL171 was introduced by H&F in 1978. It converts a solid analog metering product to a digital system with enough stability to be used on critical directional arrays.

**Controls up to 100 sites**

The DRC190 multisite programmable transmitter control system controls up to 100 sites with up to 50 channels of metering, 50 raise/lower control lines and 96 status lines.

Each unit includes a basic interpreter allowing automatic control and logging with a standard CRT terminal. An external computer can also be used to control the DRC190. This system has been used by networks and other large station groups since 1984. Sites are typically linked by two- or four-wire voice-grade circuits or UHF radio links.

The DRC190 uses a bus communications architecture in which all sites hear all the network traffic and pull off only the packets addressed to that site. The DRC190 includes packet controllers for driving external UHF radio transmitters. The packet controller allows several stations in a market to share the same part 74 P channel.

The DRC200 is the latest product in the H&F/Dove transmitter control product line. Each site includes a rack-mounted 486 computer with 4 MB of RAM, VGA video, 500 MB (or larger) hard drive, keyboard, printer and mouse. Transmitter site units include 48 analog inputs, 48 status inputs and 48 control outputs.

As an option, they can include extra RS 232 ports to interface with other transmitter site monitors. Existing drivers support the Broadcast Electronics MVDS monitor.

The DRC200 allows the user to design an unlimited number of user screens, each with data from up to 254 sites. User screens are specified using text files with "tags" for variable data and commands, similar to

hypertext markup language (HTML) used on World Wide Web pages. In a similar manner, users describe the printed log

texture. Each unit can connect with up to 16 other sites, and each of those can connect with up to 16 sites. Up to 254 sites

for evaluation.

If it is destined for another site, the DRC200 consults its routing tables and sends the packet on its way. On system reset, the DRC200 learns the routing to all other sites in the system, building its own routing table.

If a particular path between sites fails, the port times out, resetting the system. It then finds a new route to the site, if one exists. Sites can be connected using two-wire voice grade circuits, RS-232 circuits, or UHF radio circuits (an internal

packet modem for driving an external UHF transceiver is available). Design improvements on the DRC200 continue.

Design changes being considered include changing the user interface to a standard HTML browser running under Windows, bringing full graphics to the product.

For more information from Dove Systems, contact the company in California at (805) 541-0200; via its URL at <http://www.dovesystems.com/dove>; or circle Reader Service 41.

## The DRC190 controls up to 100 sites with up to 50 channels.

format. A spreadsheet is utilized for system calibration (allowing for any user-described calibration curve) and automatic control.

The DRC200 sites communicate using a routed web archi-

can be connected in this web. As each site receives packets from other sites, it evaluates the header to determine what to do with the packet. If it is destined for this site, the packet is passed on

# Move Up from Carts to Touchscreen Digital Audio

### Play Any Audio at a Touch

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

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

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



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



### The World's Fastest Playback!

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

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

### Instant Requests from Hard Drive

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

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



### Live Copy On Screen

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

### The Best Digital Audio

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

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



### Sound Better With Digital Editing

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

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The National Association of Broadcasters announced two promotions to senior vice president.

**Dede Ferrell**, vice president, Senate congressional liaison, has been promoted to senior vice president, government relations. She will be responsible for both House and Senate lobbying efforts for the NAB.

**David Dziedzic** has been named senior vice president, advertising and services. He was with the Texas Rangers as vice president of marketing. He will handle advertising and event marketing connected with NAB conventions, conferences and special events, in addition to sales of NAB merchandise, publications and insurance and financial services.

**Keystone Communications Corp.** has appointed **April Hodgson** as director of sales for the newly-formed midwest

and southeast regions. She will be based in Pittsburgh, Pa.

**Russell Bittner**, based in New York, is now director of Latin America sales.

**Sony's SW Networks** has entered into a consultation agreement with **Shirley Maldonado** for its smooth FM international — a new adult contemporary format service targeting worldwide radio markets while offering a domestic NAC programming package.

**Steven Zeigler** joins **Advanced Productions** as partner, technical director and producer for the Into Tomorrow Radio Network. He comes from Cox Radio in Miami, after 26 years of service at WIOD(AM), WHQT(FM) and WFLC(FM).

**Tony Battiato** has been appointed

account executive of **Westwood One Entertainment** for their New York sales office.

**Battiato** joins Westwood One from Interep Radio where he served as radio marketing specialist, designing customized packages for new business clients.

The **Consumer Electronics Manufacturers Association (CEMA)** announced the election of **Steven Teachout**, president of CNA Inc., to the Board of Governors of the Uniform Code Council (UCC). The UCC administers the Universal Product Code (UPC) bar code in addition to most of the retail electronic data information procedures.

**Nat Hecht** joins **D.A.S. Audio of America** as director of national sales and marketing. Prior to joining D.A.S. Audio of America, he worked for Soundcraft U.S.A. and Soundcraft U.K. at JBL Professional.

**Tapscan Inc.** promoted **Barbara Godfrey** to vice president of its agency division. She is based out of Tapscan's corporate headquarters in Birmingham, Ala.

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GM, WTMX/Chicago



Pictured: The forthcoming hot new Windows/GUI version of Master Control, showing (top to bottom) status bar, next-to-play elements, program log and audition window.

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### TECHNOLOGY UPDATE

#### WOHLER

**SAN FRANCISCO** The MSM-2 1U multiple source audio metering systems from **Wohler Technologies** can be housed in a two-rackspace unit. The additional rack height allows use of 20-segment, tri-color bar graph meters for precise level monitoring across a wider dynamic range.

Two different types of metering modules are available. The LV-2 module provides accurate indication across a 76 dB range, making it useful for critical monitoring of program material with a wide dynamic range. The lower priced LV-2B module provides indication across a 50 dB range. Both modules are switchable for VU or PPM characteristics, and thresholds for zero indication are DIP-switch selectable at -6, 0, +4 and +8 dBv.



The MSM-2 can be ordered with up to 20 channels of metering, with modules arranged in 10 "windows" provided on the front faceplate. Users may specify arrangement of single meters or meter pairs.

The standard LV-2 meter module incorporates special LED indicators for low-level activity and signal peaks. The peak indicator has an adjustable threshold (up to +16 dB) and hold time is proportional to peak level. The low-level activity indicator utilizes a two-color LED to indicate either constant signal (noise) or changing signal (program) at levels between -60 dB or -40 dB.

For more information from **Wohler Technologies**, contact **Patrick Hayes** in California at (415) 589-5676; fax: (415) 589-1355; or circle **Reader Service 29**.

## PRODUCT EVALUATION

# Practicality Key to Reliable Lindos Test Set

by Sam Wise  
Engineer  
Arup Acoustics

**NEWPORT, England** In 1985, Lindos Electronics launched the original LA100 Audio Measuring System. (available through Harris Corp.) bringing automated audio testing to the masses at a price that undercut the competition by more than 50 percent.

## Individual Tests can be manually activated ... and the results automatically stored.

Since then, software enhancements have added useful features. In 1996, the first significant hardware change to the LA100 was announced: internal illumination of the LCD display.

### Industry standard

So what has enabled the LA100 to remain an industry standard for 11 years? Four important features separate the LA100 from the crowd.

First, it is not a single unit, but two: the LA101 Audio Oscillator and the LA102 Audio Measuring Set. This makes end-to-end measurements of a long audio pathway, such as a transmitter link, easy and inexpensive to accomplish.

Second, each unit can run for five hours from its internal battery power.

Third, the LA101 can control the LA102 measuring set by sending FSK signals through the measurement pathway. The technique is similar to a data modem, but at the rather slow rate of 110 baud, making it relatively immune to noise of other pathway deficiencies. On receipt of the signal, the LA102 prepares for the required measurement, completes it and either stores the result or, if a printer is attached, prints it out.

Last but not least, the test sets are small and lightweight, easing the load when climbing a transmitter or tower.

Combinations of standard test segments are stored as sequences within the LA101 unit. Segments are typically a series of related measurements — for example, crosstalk measurements at a series of six standard frequencies covering the audio range.

More than 60 test segments built in, covering most standard measurement requirements, and more than 60 preprogrammed standard sequences, some of which are segment-like, ease access to LA100 special features.

In addition, users can build 10 custom sequences from the range of available segments. A typical sequence completes in under a minute. This makes the LA100 very effective for routine performance checks, which can help prevent unforeseen equipment failures.

### Computer control

Another feature of the LA100 system is external computer programming and control. Though operation of routinely used functions of LA100 is rather logical, programming it via its front panel can be tedious. To overcome this, external pro-

gramming and control is provided via easy-to-use Windows-based software.

Individual tests can be manually activated, test sequences can be configured, measurement tolerance limits can be set up and the results automatically stored. Thus, the LA100 can serve as a production line test or calibration center — with specific test sequences available that are configured to match user-specific pieces of audio equipment.

Software to control an LA100 through a Psion Series 3a computer has just been launched, wedding the portability of the LA100 with that of a palmtop computer.

Tones are produced by using digital waveform synthesis with crystal-locked frequency accuracy in one-third octave steps or fine 32 steps per octave from 5 Hz to 38 kHz, covering the usual requirements of audio for studio and broadcast use.

Amplitude adjusts in either 1 dB or 0.01 dB steps, calibrated during production by a look-up table in EPROM specific to each LA101. The range is -100 dBu to +26 dBu, which is sufficient for all but the most strenuous lab applications.

Within programmed sequences the LA102 can generate tone bursts as well, allowing checks of audio metering system ballistics or even sound level meter time constants.

Finally, three different impedances are provided: 10 ohms on the rear-panel XLR sockets and a selectable 75 or 600 ohms on the front-panel broadcast-standard jack sockets. The display on the newest model is a back-illuminated LCD graphics display, which offers manual instrument control from 14 multifunction push button switches mounted on the front panel.

### Features

The LA102 measures level, frequency, phase, weighted and unweighted noise, crosstalk with bandpass receiver filter, wow and flutter, rumble and THD+N to most European and U.S. standards. Automated THD+N measurements will tolerate considerable level and frequency variations, which is useful for analog

tape recorder testing.

The LA102 will even ignore test tape voice announcements. In addition, various other tests can be undertaken, including quantization distortion and frequency intermodulation — but with a limited range of test signals from the LA101.

Measurement range is from -95 dBu to +28 dBu wideband, improving on crosstalk and THD+N due to bandpass filtering. RMS, VU or PPM meter ballistics are available with various frequency limits, allowing the instrument to display not only test results, but program levels too. Tolerance limits can be set for tests within a sequence, giving an immediate

pass/fail result.

I have used a Lindos LA100 for seven years in site commissioning work. It is lightweight, reliable and just plain useful. It is more up-to-date today than when I bought it, thanks to the Lindos policy of ongoing product improvement.

The downside could be its lack of digital domain measurements, but for many users these are not necessary or can be provided by relatively inexpensive handheld testers.

For more information from Lindos Electronics, contact its distributor, Harris Broadcast Corp., in Illinois at (217) 222-8200; or circle Reader Service 62.

## Model 8718 Survey Meter

# Complex RFR Measurements Made Simple



- Auto-Ranges
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## USER REPORT

# Software Reveals Audio Spectrum

by Dennis J. Martin  
Chief Engineer  
KBIG(FM)

**LOS ANGELES** An oscilloscope is a valuable instrument for displaying the time domain (amplitude vs. time) characteristics of a signal. In audio work, however, the frequency domain (amplitude vs. frequency) is often more important and revealing. For that task, spectrum analysis is needed. Although real time analyzers (RTAs) have been available in slightly different forms for years, many were cost prohibitive. That is where your PC can help.

SpectraRTA software, from **Sound Technology**, transforms your PC and sound card into a dual channel, real time spectrum analyzer. Many analog RTAs merely provide a spectral display and perhaps a pink noise output. SpectraRTA surpasses RTAs of the past by adding Total Harmonic Distortion (THD) measurement capability, and a signal generator utility that produces a variety of test signals.

## Behind the scenes

SpectraRTA uses the PC's sound card to perform an analog to digital conversion of the input signal. Once digitized, Fast Fourier Transform (FFT) math algorithm produces the frequency domain-based signal. This marks a departure from traditional analyzers that use analog filters. Although ISO standard center frequencies and bandwidths have been preserved, FFT emulated filters have steeper "skirts." As a result, performance often exceeds that of analog filters.

The measurement spectrum is depicted as a typical two-dimensional bar or line plot: The x-axis is frequency in Hz, and the y-axis is amplitude in dB. Resolution of the x-axis is 1, one-third, or one-sixth octave. Frequency span, or bandwidth, is adjustable from a low of 125 Hz, to a high of 16 kHz in 1 octave mode; and from 160 Hz, to 20 kHz in one-third and one-sixth octave modes.

The minimum amplitude range is 10 dB, and the maximum is 200 dB; a movable cursor reads the level in each frequency band to 0.01 dB. An indicated wideband signal level may be used for sound pressure level (SPL) measurements. SpectraRTA offers six processing modes: left channel only; right only; left and right (a two-channel display); left plus right (a sum of the two); left minus right; and right minus left.

Besides flat, three standard weightings can be individually applied to the spectrum and wideband displays: A, B and C. Custom weightings and microphone compensation tables can be designed by merely creating ASCII text files. Five averaging choices are available: off, fast, medium, slow and forever.

## Total recall

Measured data can be printed, copied to the clipboard and transferred to another application, or saved directly to hard disk or in one of four memory locations. The amount of data saved is limited only by available hard disk space. Each memory can be separately labeled, level offset and saved and loaded from disk as ASCII text.

A composite memory builds a trace by

averaging or subtracting any of the four memories selected. Saved spectral plots can be recalled for comparison or analysis, displayed as limits, or printed. Up to four memories and one composite memory can be viewed on-screen.

**The most impressive feature we have found is the room response mode.**

The signal generator function of SpectraRTA produces white noise (equal energy at all frequencies); pink noise (equal energy per octave); a 1 kHz sine wave for level calibration and distortion measurements; up to 10 simultaneous tones, the frequency and level of which can be individually adjusted; a linear or log frequency sweep; and a level sweep.

Sweep times and start and stop limits are user definable.

As you might expect, measurement accuracy is dependent upon sound card performance. Frequency tolerance, which relies upon the sampling clock on the sound card, is usually within a fraction of a Hertz. Amplitude accuracy and THD can vary widely.

Professional quality sound cards, however, include balanced analog inputs and outputs and are typically flat within 0.2 dB; THD can be less than 0.0025 percent. Theoretical dynamic range is 48 dB for an 8-bit sound card, and 96 dB for a 16-bit.

## Unveiling the spectrum

The RTA mode is useful for measuring the response virtually of anything using discrete tones, a swept sine wave or pink noise. We checked an entire audio chain, including processing, using pink noise.

The most impressive feature we have found is the room response mode. We believe it is mislabeled because it is a transfer function that has applications far beyond acoustic room response. Basically an L-R (or R-L) derived signal,

## USER REPORT

# New Generation of Remote Control

by Gary Smith  
Director of Engineering  
Trumper Communications

**SALT LAKE CITY** My portfolio of stations is thicker than it used to be. I am responsible for three stations in Salt Lake City and six in Albuquerque, N.M. Fortunately, technology is keeping pace with the changing landscape of broadcast ownership.

From a Pentium PC in my office, I monitor our three Salt Lake City transmitters at two locations. I have created a custom screen that displays vital information from all three transmitters. That is the power of the new GSC3000 Site Control system from **Gentner Communications**.

You can create the screen, customize it to your taste, and it is all drag and drop, thanks in part to Windows '95 and its graphic user interface. All I had to do was look at what I liked and move it to my custom screen. I then minimize that screen while working on a spreadsheet or word processing, and should an alarm condition appear, I can immediately refocus my attention and identify the problem.

## No engineer, no problem

Although the PC provides monitoring and full access, the site controllers at the transmitters have their own, independent processors. Any time the power level exceeds or drops below a predetermined range, the GSC3000 I/O unit adjusts the transmitter and informs my computer. It can also power down transmitter A, switch the antenna to transmitter B, and power that up. So, it can keep us on-air, even if an engineer is not available.

Installation at our AM site was

easy because we had previously installed a VRC2000. We just disconnected the remote control connectors from the VRC2000, and then plugged them into the GSC I/O unit, and programmed the GSC3000 software to operate with the same channel assignment as the VRC.

We use a 28.8 U.S. Robotics external modem that connects right to the back of the GSC I/O unit, giving us dial-up access. The GSC I/O unit sits directly adjacent to my transmitter and phaser, and we have not had a single problem due to RF, even when the phone lines that we interface to the modem are unshielded twisted pair. To create a failure in the I/O unit, we literally had to coil multiple turns of cabling around the phaser's components before we could induce enough RF into the unit to cause any kind of a problem. So, unless you are planning on locating the I/O unit inside your phaser coils, you are not going to have an RF problem.

We use a Nautel solid-state 5,000 W transmitter. We programmed the GSC3000 to monitor the transmitter's operating conditions and reflected power, and take precautionary steps to prevent high reflected power. In the winter, we sometimes get three or four hours of antenna icing before the sun melts it. That increases our reflected power, which the GSC3000 will reduce accordingly.

Our two FM stations are on Farnsworth peak in the Oquirrh Mountains, southwest of Salt Lake City. The site is home to ten high-powered FM stations. Also nearby are a VHF-TV transmitter running 1.5 million watts and two UHF-TV transmitters. Several direct television, cellular,

and two-way radio facilities are also on the mountain. In short, there is plenty of RF, but we have no problems because of it.

The KISN-FM and KUMT(FM) transmitters are about 150 feet apart, with KUMT downstairs and KISN upstairs. KISN was originally controlled with a VRC2000, so we just removed the VRC2000 and reconnected the cables using Gentner's new wiring interface for status metering. We found the wiring interface panels made the status and metering interface much easier, because they provided easy access to the multipin connectors used on the back of the remote control.

**Compatibility makes it easy**  
Since the VRC2000 Command Relay unit is compatible with the GSC3000, I easily wired some status inputs to external switches. Those status inputs trigger macros I programmed using the GSC3000 software. The macros are designed for ease of operation by the onsite engineer. One of the macros I created switches that transmitter to low power and reduces the power to a preset level beyond the standard low-power setting. The other switch-activated macro returns the transmitter to high power, and automatically adjusts it again to the correct parameters. Because of these macros the engineers onsite do not have to know how to run the remote control to turn the transmitter on and make adjustments. The GSC3000 makes it a one-button no brainer.

Hardware requirements are modest: a 386 or higher CPU with math coprocessor, 8 MB RAM, 4 MB hard disk space, VGA monitor, sound card, and mouse or other pointing device.

Sound Technology's SpectraRTA software, a PC and a sound card provide measurement capability that was once largely unobtainable. It moves the engineer one step closer to measuring what he can hear.

For information from Sound Technology, contact the company in California at (800) 401-3472; fax: (408) 378-6847; or circle Reader Service 24.

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For more information from Gentner Communications, contact the company in Utah at (801) 975-7200; or circle Reader Service 35.

USER REPORT

# Wizard: An Air Chain Essential

by Mario Hieb  
KXRRK(FM)

**SALT LAKE CITY** I am a believer in the systems approach to the air chain; each element of the chain must perform at optimum, otherwise the entire system suffers. All too often, radio station engineers focus on audio processing and neglect other important elements of the FM chain such as the STL, exciter, transmitter and antenna.

To assure optimum performance of the KXRRK(FM) transmission system, I built a Quality Assurance (QA) station utilizing the Belar FMMA-1 (Wizard) modulation monitor and FMSA-1 stereo monitor.

**Location, location, location**

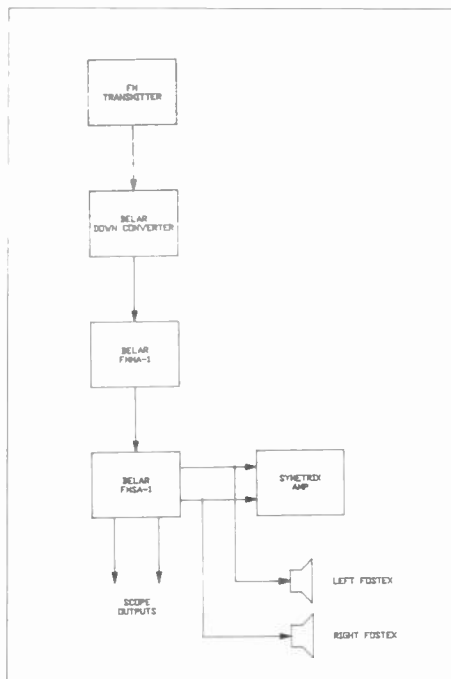
Figure 1 is a drawing of my QA station. I located the QA station at the transmitter site for a few reasons. First, I believe in taking a clean RF sample from the transmission line. Second, transmitter tuning can affect system performance; having your modulation monitor near the transmitter makes tuning easier.

The RF sample from the transmission line feeds the input of the Belar downconverter module via a short cable; I use the Option 2 downconverter module tuned to my carrier frequency. A pair of LEDs on the module makes input level adjustment easy: just turn the pot until both lights go out.

A multipair cable connects the downconverter module to the Wizard. The FMSA-1 stereo monitor is located just below the Wizard in an equipment rack. Stereo outputs drive a pair of Fostex 6301B powered monitors and a Symetrix headphone amp. Soon, I plan to install a personal computer at the transmitter site with a serial port dedicated to the Belar units. I will then be able to communicate via modem with

the Wizard and other RS-232 devices at the transmitter site.

Now a few words about the Wizard and the FMSA-1. My air chain is analog only from the air studio console to the audio processor. From the audio proces-



sor on, the signal is digital until it becomes RF. My air chain grew up, and I needed a modulation monitor that could accurately measure the higher performance.

The Wizard and the FMSA-1 are DSP based; all signal processing is done with software instead of analog circuitry. The result is a modulation monitor with better performance and less temperature-induced component drift.

Calibration of the unit is easy: just scroll the menu to the calibrate display and press the button. This is a great improvement over my old FMM-1. As Belar adds features to the Wizard and FMSA-1, you can upgrade by changing a ROM chip.

When I am setting modulation levels, the Wizard allows me to view peak modulation in three different modes: hold, time mode and infinite. Modulation is displayed on a four-digit LED with an accuracy of up to 1/10th of 1 percent.

**User-selectable**

By scrolling up or down the menu, I can select measurements including peak average modulation, peak minimum modulation, AM noise, synchronous AM noise, pilot level and pilot modulation. The Wizard allows the user to set system parameters including hold time, peak modulation indicator, peaks-per-minute indicator and time mode. I can also select peak weighting from eight different time constants. Using the Wizard software package, I can view peak, average and minimum modulation over time, storing the data to disk if I wish. In this way, I can analyze modulation easily over long periods of time.

I would like to see Belar put two RF ports on the downconverter box and allow switching from the Wizard. The first port would be the main transmitter sample, the second port would be for auxiliary transmitters tuned to the same frequency.

A quantitative measurement of group delay would be nice. Belar should also provide more documentation, like Tektronix, whose systems measurement handbooks for their television test products include a manual on how to best perform FM system measurements.

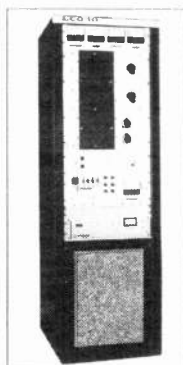
**Get the best test gear**

This may sound a bit odd, but the best equipment in your station should be your test gear. It should be more stable and of higher precision than what it measures. Whether you measure the carrier frequency, the pilot injection or the

transmitter stack temperature, your measurements are only as good as the instruments employed. Before you demo that new audio processor, STL or exciter, consider upgrading your modulation monitor. Chances are, the new gear you demo will outperform your present modulation monitor.

At KXRRK, we replaced our aging analog audio processor, STL and exciter with modern DSP-based gear. We also replaced our aging analog modulation monitor with the DSP-based Belar Wizard and FMSA-1. We are quite happy with the result: louder, cleaner audio.

For more information from Belar, contact the company in Pennsylvania at (610) 687-5550; or circle Reader Service 39.



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I need a new FM transmitter but prices are so high I may have to settle for a used one.

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**AUDIO CONTROL**

**MOUNTLAKE TERRACE, Wash.** The lasys from Audio Control Industrial is a fuzzy logic-based electro-acoustic analyzer. Through statistical analysis of amplitude, frequency and time, lasys "learns" its environment and arrives at the best possible gain, sensitivity, bandwidth and time constraints for any test.

The automatic setup process eliminates test variances due to different operators. All test results and formats relate directly to real audio devices, such as loudspeakers, amplifiers, crossovers, limiters, delays and equalizers and their actual performance parameters. There are tests of system levels to verify magnitude and coherence versus frequency performance.

Lasys provides the user with the answers necessary to complete, optimize and verify any installation. This ensures maximum performance and reliability based on reality, not subjectivity.

Features include: crossover points and levels, programmable sweep/sine/noise, coherence and frequency response, delay and polarity, thermal limitation and more.

For more information from Audio Control Industrial, contact the company in Washington at (206) 775-8461; fax: (206) 778-3166; or circle Reader Service 124.

**ATI**

**HORSHAM, Pa.** BGD200 and BGD400 dual and quad bargraph meters from Audio Technologies Inc. allow the display of up to 12 audio lines in a single rack space. Remote, shared power supplies for these three-color VU or PPM meters make mounting easy, even directly under video monitors or critical audio circuits with no possibility of magnetic interference.

The meters are available in two-channel horizontal, with and without phase indication, headphone monitor and four-channel configurations. The multi-color, 10-segment displays are visible even in bright sunlight. VU models display -20 to +3 dB around 0VU, PPM models cover -15 to +12 dB. Zero reference levels for both models are selectable to -10, +4 or 8 dBu, with front panel trimmers for adjustment.



Balanced, high-impedance inputs bridge even -10 dBu semi-pro unbalanced lines without loading. Two-piece, screw-clamp connectors for each input make installation easy.

For more information from ATI, contact the company in Pennsylvania at (215) 443-0330; fax: (215) 443-0394; or circle Reader Service 172.

**CRL**

**TEMPE, Ariz.** Usually when you connect two AES/EBU devices together they work nicely together. But what happens when you get a status error LED indication or no audio from one machine to another?

In the analog world it is easy to find out by measuring the audio with a meter,

scope or pair of headphones.

The AES/EBU signal, however, is a bi-phase encoded signal with a range of sampling rates from 32 to 48 kHz. Also, the signal is loaded with error connection and status information bits. Therefore, analog test methods will not work here.

To make AES/EBU measurements easy, Circuit Research Labs Inc. introduced the DAA-50 Digital Audio Analyzer. It is a small, pocket-sized device that can take any AES/EBU, S/PDIF or IEC958 bit stream and display the status of the signal, plus decode it back to stereo analog audio. The LED display of the DAA-50 displays sample frequency, type of signal (professional or consumer, original work or copyright inhibited) and presence of pre-emphasis. In cases where there is a transmission problem, the DAA-50 can show the following types of errors: no lock, bi-phase coding error, parity error, CRC error, slipped sample error, confidence error and validity bit error.

The DAA-50 has a high-quality analog stereo output that can drive headphones. The DAA-50 can be used as a backup AES/EBU decoder for emergency applications. The unit weighs 150 grams and is battery powered or can be used with its included AC adapter. This compact analyzer is a must for the next generation of tools for your installation. The first time there is a digital audio connection problem, you will wish that the CRL DAA-50 was already in your pocket.

For more information from Circuit Research Labs, contact Bill Ammons in Arizona at (602) 438-0888, (800) 535-7648; fax: (602) 438-8227; or circle Reader Service 86.

**HOLADAY**

**EDEN PRAIRIE, Minn.** Holaday Industries Inc. expands their line of RF monitors with the HI-3510 personal microwave monitor. The HI-3510 microwave monitor is a small portable device designed to detect and alert the wearer to potentially harmful levels of electromagnetic radiation.

The HI-3510 expands on the capabilities of the Holaday HI-3520 microwave monitor, allowing the customer to select the instrument depending on the frequency that is monitored. The HI-3510 can detect non-ionizing radiation from RF and microwave sources in the frequency range of 50 MHz to 1.2 GHz.

The HI-3510 allows the user to set the alarm warning level anywhere in the range from 0.2 to 20 mW/cm<sup>2</sup>. The user can also choose either of two measurement modes: instantaneous exposure level or a six minute average measurement.

The measurements are displayed on a three-digit LCD readout. A 10-segment bar graph, normalized to the selected alarm warning level, aids in obtaining a quick visual determination of the hazard level.

For more information from Holaday Industries, contact the company in Minnesota at (612) 934-4920; fax: (612) 934-3604; or circle Reader Service 129.

**HEWLETT-PACKARD**

**SANTA ROSA, Calif.** Interference on the frequency spectrum causes interruption of services, which can lead to customer dissatisfaction and ultimately loss of revenue. Careful monitoring of the frequency spectrum to detect interference is an important part of a plan for base

station installation and maintenance.

To monitor the frequency spectrum effectively requires the help of instruments that can simplify measurements work continuously without an operator in attendance, and coordinate frequency data into usable reports.

Hewlett-Packard has a spectrum monitoring system with these capabilities: the HP E4900A. This portable, compact system uses two modes of operation, interactive and automatic. In interactive mode, the system is controlled with a computer keyboard and mouse, either locally or remotely using a modem.

Whether clearing a band prior to transmitter installation or tracking down interference afterwards, interactive monitoring is the first step. Observe the frequency spectrum and look to see how the signals related.

Interactive monitoring helps identify the suspect bands that you want to examine further, and it helps to decide what measurements to make: signal logins, carrier, spectral occupancy, statistics. This information then gets incorporated into an automatic monitoring plan.

A task scheduling feature allows setting the system to run whenever you want to program a scheduled time. Another useful coordination feature is the alarm function. If there is an interference signal, a test can be set up in which the system automatically traps any signal that triggers an alarm condition.

The system will also perform one of three actions. It can store the trace for later viewing; perform a carrier measurement to get additional details of amplitude, frequency, signal-to-noise; or with optional hardware, demodulate and record the signal for later listening.

Results can be retrieved over a modem and analyzed at the central site. Standard reports or data can be generated and exported into a spreadsheet. By scheduling tasks for unattended operation, by enabling remote operation, and by detecting interference with the alarm function, the spectrum monitoring system frees operators for other work and helps increase productivity.

For more information from Hewlett-Packard, contact the company in California at (707) 577-5572; fax: (707) 577-5669; or circle Reader Service 130.

**TEKTRONIX**

**WILSONVILLE, Ore.** The new UPL audio analyzer from Tektronix Inc. is a high-speed, low-distortion dual-domain audio measurement tool. It can perform a number of audio measurements, but is ideal for use in manufacturing, service and research and development areas.

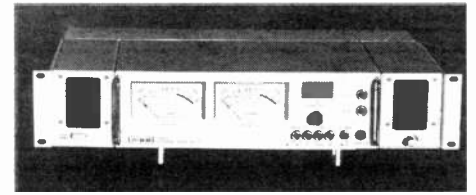
The UPL features options for flexible digital interface testing, including jitter analysis and generation. Analog signal pre-processing extends dynamic range far beyond that of the internal 20-bit converter and that means it can handle tomorrow's 20-plus bit converter designs. The 22-pound analyzer has a built-in 486 PC that serves as a tool for installation and field service applications.

Additional features include an integrated program generator, which in logging mode translates each manual control step into a complete IEC/IEEE-bus program line with correct syntax.

For more information from Tektronix Inc., contact its Measurement Business Division in Massachusetts at (800) 426-2200 (press 3, code 568); fax: (413) 448-8033; or circle Reader Service 87.

**WARD-BECK**

**SCARBOROUGH, Ontario** The Ward-Beck Systems M445 extended range meter/monitor system offers the function of a rack-mounted monitor system with the flexibility of a precision, portable, extended-range meter. An auto-



matic charger ensures that the unit is always ready for portable measuring duties. Fully charged, the batteries will last for more than eight hours.

Features include: full-sized VU meters conforming to ANSI C16.5; 1 dB per step sensitivity allowing measurement of signals from -80 dB to +33 dB; stereo or L+R/L-R metering; headset jack; and compact, lightweight construction.

For more information from Ward-Beck Systems, contact the company in Canada at (416) 438-6550; or circle Reader Service 30.

# 65 Years Ago

Reprinted from Radio World  
(January 9, 1932).

Editor's note: The RW of old, printed for a time in the 1920s and 1930s and today's RW are unrelated except in name.

## FINDS SIGNAL STRENGTH UP 400 PER CENT.

Washington. Dr. Harlan T. Stetson, director of the Perkins Observatory of Ohio Wesleyan University, before a meeting of the American Astronomical Society recently announced the results of his latest observations on the relation between sun spots and radio reception.

**Corroborates Himself**

These agree with his former conclusions based on data collected in Cambridge, Mass.

His latest data were collected at Delaware, Ohio, by nightly observation of the signal strength from WBBW, Chicago, Ill., about 300 miles distant. During the past year, he stated, the sun spots have decreased about 50 per cent. and at the same time the improvement in the signal strength has been about 400 per cent. Since the results obtained in Ohio and Massachusetts are the same, although the distance between the observation points and the direction of wave travel was different, Dr. Stetson concluded that the effect is general.

**Effect of Meteors**

A. M. Skellett, of the Bell Laboratories in New York, presented another paper on the effect of meteors on radio. During the period of Leonid meteor showers in August and November there was considerable interference with transatlantic reception of short waves, and during the height of the meteor shower connection with England was impossible. Mr. Skellett stated, however, that the meteors may not have been responsible because during the same time there was a considerable magnetic disturbance. Mr. Skellett's theory is that as the meteors enter the atmosphere they ionize the air and so change the position of the Kennelly-Heaviside layer.



**Lindy Williams**  
**V.P. Engineering**  
**Lotus Communications**  
**Los Angeles, California**

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**Chief Engineer**  
**WSNE**

**East Providence, Rhode Island**

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**Chief Engineer**  
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**Los Angeles, California**

"The RE27N/D has the fullness of a ribbon with the punch of a shotgun condenser microphone. The pattern is very good, giving good backside rejection of noise. Congratulations on building such a fine microphone."

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## SPECIAL REPORT

# QEI 691 Delivers Surefire Accuracy

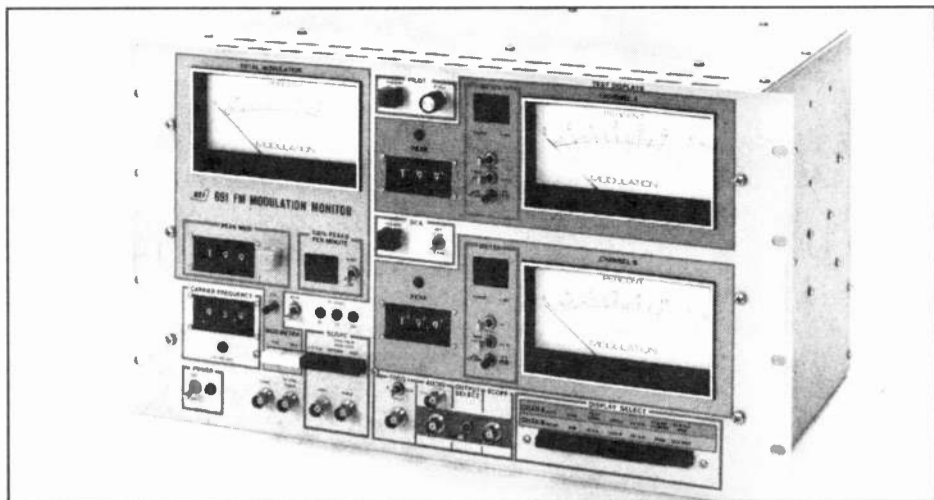
**WILLIAMSTOWN, N.J.** The FM modulation monitor is the most important element in determining a station's maximum legal modulation limit.

To deliver accurate information, the system must be properly designed and receive an RF signal sample as free of multipath as possible.

The QEI 691 modulation monitor is accurate because of its Bessel null calibration. This feature enables the user to verify the monitor's accuracy at the radio

station. It also helps to determine if the RF sample is sufficient to render useful data. Because the 691 has all the necessary circuitry to convert any X-Y input oscilloscope into a spectrum analyzer, the station engineer can be certain that the monitor and the signal being monitored is within tolerance.

The baseband portion of the QEI 691 contains a total modulation meter that is switch-selectable to display either positive or negative modulation peaks. The



The 691 Modulation Monitor from QEI

addition of the QEI Variable Peak Duration Test Option (VPTDTO) allows

the 691 peak flasher to display peaks that are weighed by a combination of duration of the peak or the total number of peaks within a 5 millisecond window as follows: Only individual peaks greater than a preset length of time (adjustable from 100-1000 microseconds) will be displayed on the total peak flasher.

The baseband portion of the 691 contains the carrier frequency thumbwheel, RF level indicators, power switch, mute switch and baseband test output. These outputs include BNC connectors to drive the oscilloscope as either a spectrum analyzer or vectorscope.

Dispersion for the spectrum display is selected by push buttons for narrow (240 kHz) or wide (700 kHz). This allows viewing your (or your competition's) modulation envelope for analysis. The 691 also contains a signal sampler that can handle up to 50 W of RF. Simply connect a suitable load to the rear panel BNC and cable your exciter to the RF input. The 691 will now yield all its features for troubleshooting of the exciter.

The stereo and SCA portion contain all the necessary controls, meters and outputs for measurements and tests. Two large meters are grouped vertically for quick eye scan and are switched together for ease in common stereo measurements. The meters may also be switched to VU ballistics and de-emphasized for visual reference of apparent loudness.

Autorange operation allows a quick, easy check of separation, crosstalk or kHz suppression, stereo generator 19 kHz to 38 kHz phase alignment and other test functions. The 691 performs the SCA monitoring function if an optional SCA monitor card is installed. One or two SCA channels may be monitored by this option. The SCA card can be installed if the cards are purchased after the test set is in service. In addition to 67 and 92 kHz SCA monitoring frequencies, the 691 SCA card is available to monitor 57 kHz RDS and RBDS.

To achieve consistent maximized modulation, the 691's remote peak flasher output can be connected to the QEI model 690 FM automod. The FM automod is a closed loop composite Automatic Gain Control (AGC), which takes input from any modulation monitor's peak flasher output. It will continually monitor and adjust the composite total modulation and maintain the preset level regardless of program density changes. The 690 FM automod, when used with the 691 modulation monitor, will offer the most competitive composite signal available.

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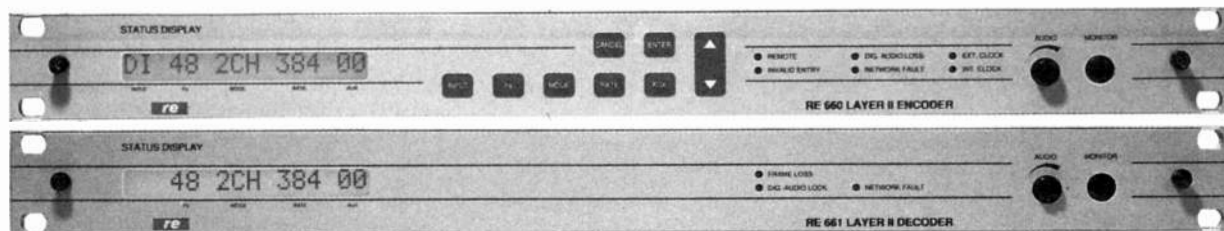


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**Hafler DH-200** stereo pwr amp (2), 100 W per chnl, rackmount w/front-panel stereo level control, excel cond, \$285; Kenwood KA-5700 stereo amp & loudspeaker system, produces 40 W per chnl w/(4) Radio Shack Mimimus-7 loudspeakers w/mounting brackets, speaker cables & road case for all, complete system, \$345. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016, 818-359-8012.

### Want To Buy

**Bogen MO200 amp**, Dynaco MK IV, McIntosh MC60, McIntosh MC40, US 6550 or British KT88 vacuum tubes, R Cobb, Solid State Recdg, 1044 Lightfoot Rd, Wimauma FL 33598, 813-634-1940.

**WANTED HiFi/Commercial tube amps, compressors, mixers, horn speakers, Altec, McIntosh, JBL, EV, WE, Tannoy, Marantz, Ampex, etc. 405-737-3312 FAX: 3355**

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**Socket for 620 W beacon bulbs**. B Hawkins, WENS, 950 N Meridian St, Indianapolis IN 46204, 317-684-8411.

**Jampro JSLP-20 2 bay FM**, tuned to 99.3, BO, Phelps-Dodge CFM-HP10 10 bay FM, tuned to 99.5. R Siebert, KUTT, 414 4th, Fairbury NE 68352, 402-729-3382.

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### Want To Buy

**Neve, API, MXR, Lexicon, mic pres, EQs, delay, compressors, Harmonizers, reverbs**. T Coffman, POB 17203, San Diego CA 92177, 619-571-5031.

**Lang, Pultec, Sontec EQ's**. R Fuelle, Hit Single Recdg, 1935C Friendship Dr, El Cajon CA 92020, 619-258-1080.

**Tascam or Otari 2 or 4 trk r-r's**, slider stereo on-air consoles, mono cart machines, etc, in excel cond. B Lang, Media Arts Ctr, Media Park, 130 Birdseye Rd, Farmington CT 06032, 1-800-887-2346 or fax 860-677-1141.

**Compressors & EQ's**, tube & solid state. W Gunn, Box 2902, Palm Springs CA 92262, 619-320-0728.

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### Want To Sell

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**SMC 350 Carousels (6)**, as is, \$50 ea; one SMC 3060 60 event programmer, as is, \$100. R Miller, Miller Media Group, 111 West Main Cross, Taylorville IL 62568, 217-824-3395.

**Sonomag 350** random select Carousels (2), working cond, \$25 ea; (2) Sonomag 250 Carousels, one works, one for parts w/random select conversion unit, RP 1000 programmer/controller; PDC-3A automation clock, DT-1 data terminal, monitor & TTY printer, Randy, KDKD, 2201 Antioch Rd, Clinton MO 64735, 816-885-6141.

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### Want To Sell

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**ITC triple deck**, two are OK, one needs board repair, \$500. CE Jones, WMNY, 7620 Old #6 Hwy, Santee SC 29142, 803-854-6396.

**ITC Delta 1 (3)** mono play only, triple tones; ITC Delta PD II mono, play only; (2) ITC Delta PD II mono, P/R; misc cart racks, carts, Kevin, KMCM, Rm 1404 East, 332 Minnesota St, St Paul MN 55101, 406-232-5626.

**ITC Delta PB (2)**, \$600 ea; (2) ITC cart decks, \$100 ea. B Evans, WQXE, 245 W Dixie, Elizabethtown KY 42701, 502-737-8000.

**Fidelipac CTR 124 stereo R/P**, like new, \$1500/BO. Jeff, KTKK, 2470 N Fairfield, Layton UT 84047, 801-771-4171.

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**Streight Wire Audio program cards** for ITC cart machines, also need any diagrams or documentation on these cards. M Friend, WNRN, 2125-L Ivy Rd, Charlottesville VA 22903, 804-971-4096.

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**Auditronics 218 fader modules (4)**, great shape, \$500 ea/BO. B Jeffries, WQOL, 6990 North US 1, Ft Pierce FL 34946, 561-335-9300.

**Wheatstone SP-6** prod/air console, 24x8 frame w/9 mono mic/line input modules, 2 stereo input modules, 2 dual mono output modules, L R output module, monitor/comm module, clock/timer module, excel cond, 7 yrs old. G Nichols, WERU, Blue Hill Falls, Maine, 207-374-2313.

**BE 8M150 8 chnl mono**, gd cond, \$650; Fostex 350 8 chnl stereo mixer, \$300. P Deen, WAJQ, 208 Dougins St, Alma GA 31510, 912-632-1000.

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Shure mixer. \$400. T Balistreri. SportsRadio. 1801 Coral Dr. Waukesha WI 53186. 414-784-2863.

Spirit Live/4. 12x4x2 w/2 addtl stereo inputs & 5 aux busses. custom modifications. excel cond. \$1600. R Streicher, Pacific A/V Enter. 545 Cloverleaf Way. Monrovia CA 91016. 818-359-8012.

Soundcraft 600. 32x16. w/patchbay. mint. \$6950; Tascam 512. 12x8 mixer. \$750; Tascam 520. 20x8x16 mixer. \$1750; Allen & Heath SYNCON 28x24. great sound. \$8000; Ramsa 820 mixer. \$2200. W Gunn. Box 2902. Palm Springs CA 92262. 619-320-0728.

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Moseley 5CG-3T stereo gen. \$300. P Deen. WAJQ. 208 Dougins St. Alma GA 31510. 912-632-1000.

Orban 245E stereo synthesizer. excel cond. J Gelo. 941-642-6899.

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dbx 160, 165; UREI 1176, 1178; RCA BA-6A. Neve 2254, 2264 compressor/limiters. R Fuelle. Hit Single Recdg. 1935C Friendship Dr. El Cajon CA 92020. 619-258-1080.

Valley 440 limiter. A Polhemus. Excilibur Sound. 750 8th Ave. Nyny 10036. 212-302-9010.

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Tascam MTS-1000 MIDI-izer, SMPTE/MIDI synchronizer for Tascam serial recorders. includes Serial cable. \$500. C Yengst. WAWZ. Weston Canal Rd. Zarephath NJ 08890. 908-469-0991.

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Otari ARS 1000DC (3). stereo PB; (3) ITC 770 stereo PB; (3) Technics RS-1506-US P/R. 4 trk stereo; two persons auto sequencers. Kevin. KMCM. Rm 1404 East. 332 Minnesota St. St Paul MN 55101. 406-232-5626.

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Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

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**Want To Sell**

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**Want To Buy**

SCPC audio rcvr. used RX OK but must be in gd cond B Bach, KFSN, 1777 G St, Fresno CA 93701, 209-299-4251.

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Radio station in SC, NC or GA. Call 800-948-6244.

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**Want To Sell**

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**Want To Buy**

SCA gen 67 kHz, used EQ OK, must be in gd cond, B Bach, KFSN, 1777 G St, Fresno CA 93706 209-299-4251

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**Want To Sell**

AOR prod library, analog. LPs, reels & cassettes, 7" empty reels boxed, BO Call 703-440-8621.

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**TEST EQUIPMENT**

**Want To Sell**

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Bird 4715-200 5 kW Thru-line wattmeter, in excel cond \$500 Fluke 8922A RMS meter to 10 mHz choice of voltage or DB w/adjustable impedance settings gd cond, \$200; General Radio 1932A audio dist/noise meter gd cond, \$150, Wayne Kerr 601 RF bridge gd cond, \$300 D Messing, KQXC 1819 2nd Ave, Nebraska City NE 68410 402-873-7061

Measurements 65B RF signal gen, \$50, Jerrold 704B FM field strength meter gd cond, \$150 Heath IM-58 harmonic dist meter, gd cond, \$75, B&K 1574 oscilloscope 30 mHz, dual trace triggered w/2 probes, excel cond, \$225, D Messing, KQXC, 1819 2nd Ave, Nebraska City NE 68410 402-873-7061

For details on space availability contact Simone at  
**1-703-998-7600**  
**Ext.154**

Tektronix oscilloscope 60 mHz, new w box never used \$950 B Bach, KFSN, 1777 G St, Fresno CA 93701, 209-299-4251

**Want To Buy**

RCA WV510A service manual (copy), would also consider buying entire motor for parts W Wheeler, Tech Service/Prod, 103 Portman Villa, Black Mountain NC 28711, 704-669-8588 leave message.

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- 3CX10,000A7
- 3CX10,000H3
- 3CX15,000A3
- 3CX15,000A7
- 3CX15,000H3
- 3CW20,000H3
- 3CW20,000H7
- 3CW30,000H3
- 4CX250B
- 4CX250BC
- 4CX250BM
- 4CX250BT
- 4CX250R
- 4CX350A
- 4CX350AC
- 4CX400A
- 4CX800A
- 4CPX800A
- 4CX1500A
- 4CX1600B
- 4CX1600U
- 4CX3500A
- 4CX5000A
- 4CX5000R
- 4CX7500A
- 4CX10,000D
- 4CX15,000A
- 4CX15,000J
- 4CW10,000A
- 4X150A
- 5CX1500A
- 5CX1500B
- 572B
- 5U4G
- 6550C
- (See SV6550C)
- 6AS7G
- 6BM8
- 6L6GC
- (See SV6L6GC)
- 811A
- 833A
- 8161R
- 8560AS
- EF86
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- EL509
- SV572-3
- SV572-10
- SV572-30
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50, 50A1, 101D, 205D, 210, 217A,  
274A B, 300A B, 350A B, 845,  
6550, WD11, WD12 and other old  
tubes. Fala Electronics, PO Box  
1376, Milwaukee, WI 53201.

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#### Want To Sell

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Title \_\_\_\_\_

Company/Station \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_

Zip Code \_\_\_\_\_

Telephone \_\_\_\_\_

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Signature \_\_\_\_\_ Date \_\_\_\_\_

Please check only one entry for each category:

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|--|---|
| <input type="checkbox"/> D Combination AM/FM station | <input type="checkbox"/> F Recording Studio             |
| <input type="checkbox"/> A Commercial AM station     | <input type="checkbox"/> K Radio Station Services       |
| <input type="checkbox"/> B Commercial FM station     | <input type="checkbox"/> G TV station/teletext facility |
| <input type="checkbox"/> C Educational FM station    | <input type="checkbox"/> H Consultant/ind engineer      |
| <input type="checkbox"/> E Network/group owner       | <input type="checkbox"/> I Mfg distributor or dealer    |
|  | <input type="checkbox"/> J Other                        |

#### II. Job Function

- |   |  |
|---|--|
| <input type="checkbox"/> A Ownership              | <input type="checkbox"/> G Sales           |
| <input type="checkbox"/> B General management     | <input type="checkbox"/> E News operations |
| <input type="checkbox"/> C Engineering            | <input type="checkbox"/> F Other (specify) |
| <input type="checkbox"/> D Programming production |  |

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Make: \_\_\_\_\_

Model: \_\_\_\_\_

Brief Description: \_\_\_\_\_

Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_

Make: \_\_\_\_\_

Model: \_\_\_\_\_

Brief Description: \_\_\_\_\_

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WTS  WTB  Category: \_\_\_\_\_

Make: \_\_\_\_\_

Model: \_\_\_\_\_

Brief Description: \_\_\_\_\_

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WTS  WTB  Category: \_\_\_\_\_

Make: \_\_\_\_\_

Model: \_\_\_\_\_

Brief Description: \_\_\_\_\_

Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_

Make: \_\_\_\_\_

Model: \_\_\_\_\_

Brief Description: \_\_\_\_\_

Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_

Make: \_\_\_\_\_

Model: \_\_\_\_\_

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Brief Description: \_\_\_\_\_

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\*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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| Audio Production (Other)   | Financial Services    | Repair Services          | Tubes                |
| Brokers                    | Leasing               | Satellite Equipment      | Turntables           |
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|                            | Monitors              | Tax Deductable Equipment |                      |

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	1x	3x	6x	13x
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Distributor Directory	105	100	95	90
Professional Card	74	68	62	56
Classified Line Ad	\$2.00 per word			
Blind Box Ad	\$15 additional			

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## TRANSMITTERS

### TRANSMITTERS

**Want To Sell**

**Bauer 607 1 kW FM.** Gates Harris FM-10B 10 kW FM w/Harris TE-3 exciter w/Optimod input module. RCA BTA-50H 50 kW AM R Meyers, Sound Masters. 4700 SW 75 Ave, Miami FL 33155 305-995-2115 (days), 305-264 5963 (eves/weekends). FAX 305-264-2357.

**CCA AM 5000D** recently upgraded by factory. 3CX2500F3 final and (2) 4CX3000A7 modulators, gd cond. \$12500. CE Jones. WMNY, 7620 Old #6 Hwy, Santee SC 29142. 803-854-6396

**Collins 830E-1A 5 kW FM** (2) cabinets, 250W driver & 5 kW PA. \$3500. Randy. KDKD 2201 Antioch Rd. Clinton MO 64735 816-885-6141.

**CSI FM exciter.** 20 W, freq agile. \$1000. M Taylor. KNEO. 10827 E Hwy 86, Neosho MO 64850 417-451-5636.



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**Gates 1966 FM5H 5000 W** on 92.1, just removed from service. \$10,000 firm R Miller, Miller Media Group, 111 West Main Cross, Taylorville IL 62568 217-824-3395.

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**Want To Buy**

**Wilkinson 1 kW, 5 kW & 10 kW transmitters.** working condition. Communications Equipment Sales, 10050 Regency Circle, Omaha NE 68114 402-343-1308.

**1 kW FM xmtr** needed by community station on limited budget M Friend, WNRN, 2125-L Ivy Rd, Charlottesville VA 22903. 804-971-4096.

**CCA 1000D AM crystal 1110 kHz.** buy or trade for 1080 kHz. CCA 1000D AM mod transformer L Maerhofer, WOHG, Fairgrounds Rd, Huntingdon PA 16652. 814-643-9620.

**CSI T-1F or Harris/Gates FM1G/H/K.** D Davis, 1217 Valencia NE, Albuquerque NM 87110. 505-255-2431.

**FM exciter, low priced & repairable.** P Deen, WAJQ, 208 Dougins St, Alma GA 31510 912-632-1000

**McMartin AM/FM xmtr** any model, exciter or stereo modules Goodrich Ent., 11435 Manderson, Omaha NE 68164 402-493-1886.

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or fax to: 916-646-9409. EOE/EEQ. No phone calls please

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**Air talent, news & production announcer,** 10 yrs exper wants reentry as announcer after 15 yrs in engineering. Alex, 513-777-8423.

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**SBE certified technologist,** associate engineer will work for experience in the Fairfield county or surrounding areas, extensive experience in audio. Pete, 203-371-7162.

**Seeking OM, PD or APD/MD position,** 8 yrs exper, AC, 70s or oldies station, disciplined, positive, research oriented, will relocate. Rob, 201-461-0812.

**CE seeks AM/FM/TV station contract employment,** exper CET, FCC licensed, resume upon request, prefer NE. M Rakoff, 81-12 Roosevelt Ave #413, Jackson Heights NY 11372. 718-591-3859.

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**Hard working, enthusiastic bdcgt school grad** looking to fet foot in door, love production, will relocate. Greg, 405-964-5169.

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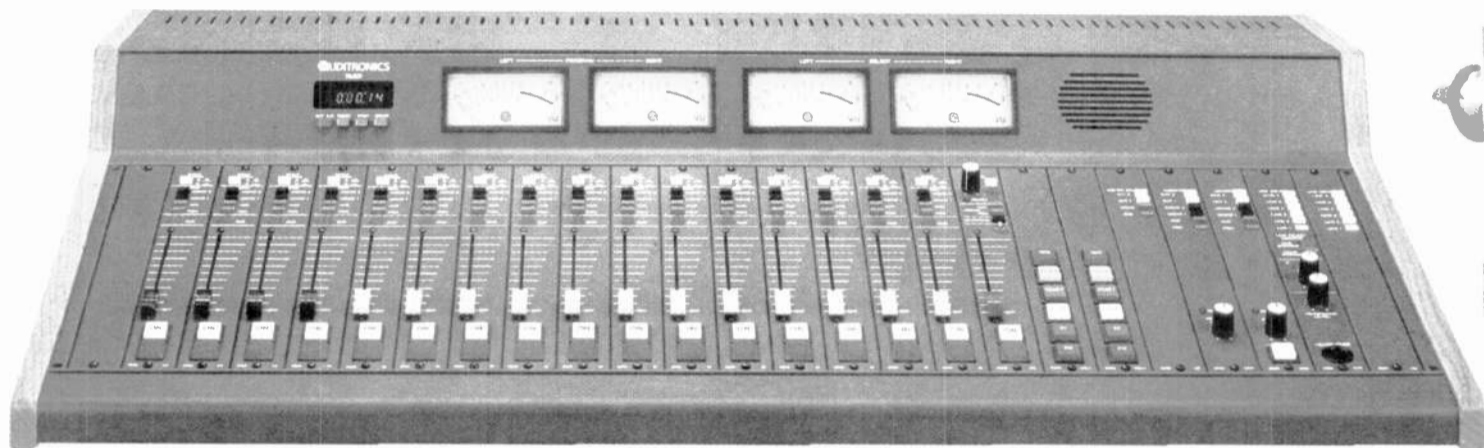
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