

**Tubes, DAB and LPFM**

Your letters and opinions are in *Readers Forum*.

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**Buyer's Guide**

The latest antennas, towers and peripherals are in this issue.

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# Radio World

The Newspaper for Radio Managers and Engineers



December 22, 1999

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▼ Ty Ford gives a listen to the AT4047/SV condenser mic from Audio-Technica.

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## Harris Buys ABG, Louth Automation

by Paul J. McLane

**CINCINNATI** Harris Corp. is buying again.

Radio's largest — and most-scrutinized — equipment supplier continues to seek market share by snapping up other companies.

Harris is acquiring The Audio Broadcast Group Inc., a Michigan-based firm with which it has competed in the distribution business. ABG is the sixth company Harris has acquired in 2-1/2 years.

Observers say the deal is a reflection of the times. Harris and its competitors are fighting to increase broadcast business, even as the stations and groups they serve consolidate.

Terms of the deal were not announced. ABG had been privately held by Phyllis Freeman and Dave Howland, who sold their stock.

The Broadcast Communications Division of Harris, based in the Cincinnati area, is part of publicly held

See SALE, page 14 ▶



**NEWS MAKER**

## Ericksen Named '99 SBE Engineer

by Randy J. Stine

**SAN FRANCISCO** Dane Ericksen can name the exact day he chose his profession. It was Oct. 4, 1957.

"I remember watching the launch of Sputnik when I was 10 years old and thinking I wanted to be an engineer," Ericksen said. Sputnik, launched by the former Soviet Union,



Dane Ericksen

was the world's first artificial satellite.

Forty-two years later, Ericksen, now age 52, is at the top of his field. The Society of Broadcast Engineers has named him its Broadcast Engineer of the Year.

Ericksen is immersed in the industry. He serves on the SBE's board of directors, is chairman of the SBE FCC Liaison Committee and is a

See DANE, page 6 ▶

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# ◆ NEWSWATCH ◆

## NAB: Receiver Studies Flawed

**WASHINGTON** Current channel interference protection standards are still necessary, the NAB stated in its reply comments about low-power FM to the commission. NAB had two engineering analyses performed on the receiver studies, one by Moffet, Larson & Johnson Inc. and the other performed by Pikholtz and Jackson.

MLJ cited problems with the FCC's own receiver study. It said the FCC used two different levels of increases in distortion, but did not say why nor

did the commission report baseline distortion figures to indicate how each receiver performed with no interference present.

Pikholtz and Jackson said car receivers need to be considered separately from stationary receivers, because "multipath fading of both the desired and interfering signals makes the problem of rejecting adjacent-channel interference more difficult." They suggested that 10 to 20 dB of extra rejection of adjacent channel interference is needed to make the adjacent channels effects on car receivers match that of stationary receivers.

## MAP Supports 100 Watts, Less

**WASHINGTON** The public interest law firm Media Access Project has told the FCC its clients who support the commission's LPFM proposal now support power levels of 100 watts or less.

Those clients, including several religious groups, support the proposed 1 kW stations "if they make sense," said MAP Attorney Cheryl Leanza. In order to get more LPFMs allocated, the groups would be willing to support the lower-power stations, a slight change from their original position.

In reply comments submitted to the

FCC, MAP wrote that if 1 kW stations are allowed, the current channel interference protection standards should remain in place. But if stations of 100 watts or lower power are authorized, second- and third-adjacent channel interference protection standards can be dropped.

Dr. Theodore Rappaport, a wireless communications professor at Virginia Polytech Institute, reviewed for MAP the four receiver studies submitted in the LPFM proceeding.

In the top 60 markets, his research showed that with the addition of LPFMs with power levels of 100 watts or less, the worst-case interference would be about 1.26 million people out of a potential audience of 81 million. This assumes second- and third-adjacent channel interference protections were dropped.

See NEWSWATCH, page 3 ►

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# FCC Sees Enforcement Woes, Hopes

by Leslie Stimson

**WASHINGTON** The FCC's new Enforcement Bureau is operational and officials say stations will now see their complaints and other enforcement actions resolved more quickly.

However the changeover was not exactly smooth. Just before the new bureau was up and running on Nov. 8, the man who used to head the former Compliance and Information Bureau, chief pirate buster Richard Lee, filed a whistleblower complaint that alleged FCC Chairman Bill Kennard and his Chief of Staff Kathy Brown committed ethics violations and unspecified violations of the Communications Act.

## Allegations

The complaint, filed with the Office of Special Counsel, alleges that Kennard and Brown ordered FCC staff to grant a temporary broadcast license to a Texas racetrack owner that an FCC field office had shut down for operating unlicensed TV, AM and FM stations after the owner, Billie Meyer, called House Commerce Committee

member Joe Barton, R-Texas. Barton called Kennard, said the FCC, and asked for help.

The OSC is an independent investigative agency within the executive branch of the federal government. One of its primary roles is to protect government employees from reprisals for whistle blowing.

Senate Commerce Committee Chairman and presidential candidate John McCain (R-Ariz.) called for an investigation. So did Kennard, after saying the okay to issue the license for the weekend racing event was a "common-sense decision."

The FCC said Meyer was "unaware he needed a license for this kind of on-site transmission." An assistant to Meyer said that Meyer had no comment.

The internal FCC investigation has begun and it does not have to be completed within a specified amount of time. Charles Willoughby, FCC assistant inspector general for investigations said, "We investigate complaints of misconduct of employees of the commission. We're authorized to prevent or prohibit fraud, waste or abuse (of power)."

Several telecom attorneys contacted by RW said that while the way the license was granted looked unusual, they did not believe Kennard broke the law.

ties of the new Enforcement Bureau. Assistant Bureau Chief John Winston said about 80 percent of pirates stop operating their stations when first contacted by the agency, but "there are about 20 percent of hard-core individuals who do not. Our efforts there are going to be vigorously enforced."

## Resources

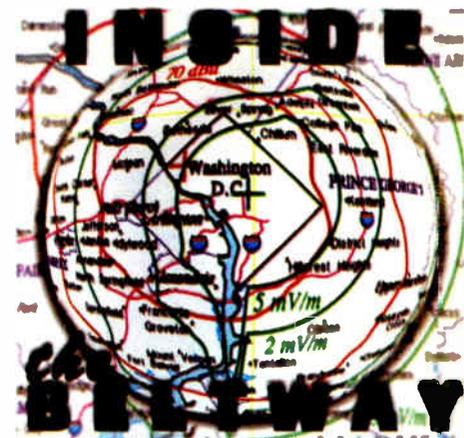
The new bureau combines enforcement resources previously scattered in different bureaus. The change is the first part of Kennard's five-year plan to streamline the agency that he submitted to congress this spring.

Kennard said the change is more than just creating a new office. "I've been frustrated in the past with the FCC because I felt the enforcement culture at the agency didn't fit the times. It was very much a culture that was a paper process."

New Enforcement Bureau Chief David Solomon said, "The FCC is moving away from saying that every problem that it sees in the communications marketplace is going to be handled by notice and comment rule making." Instead, he says, staff will look for faster ways to handle the problem.

"If we're doing an investigation, a station has a right to know quickly if there's nothing, that we're done with it. ... Regardless of what the answer is, the fair thing is to get to it quickly and get an answer."

Solomon and Kennard worked together



er in the general counsel's office. Kennard joked that Solomon was so punctual he watered his plants every week at the same time.

Some in Congress who oversee the agency do not believe it is becoming more efficient and streamlined fast enough. (These are the changes envisioned by Congress when it passed the Telecommunications Act, leading to convergence of the industries regulated by the commission.)

McCain said only at the FCC would the creation of two new bureaus (the other one is the Consumer Information Bureau) be considered downsizing.

Kennard said, "We're getting more efficient. The only way we're able to handle more work with less is to use tools like electronic filing, consolidating dockets and figuring out how to eliminate forms. It's an ongoing process. The notion that the FCC doesn't have much to do now, we should just be going away — I don't get it."

## NEWSWATCH

► NEWSWATCH, continued from page 2

### Bill Would Block LPFM

**WASHINGTON** Before Congress left Washington for the Thanksgiving holiday, five members of the House Commerce Committee, led by Mike Oxley, R-Ohio, introduced a bill to kill the FCC's low-power proposal.

H.R. 3439, called the "Radio Broadcasting Preservation Act of 1999," states the FCC "shall not prescribe rules authorizing the operation of new, low-power FM radio stations." If the legislation became law, any low-power licenses already issued would become void.

Calling the LPFM proposal misguided, NAB President and Chief Executive Officer Eddie Fritts supported the bill.

"NAB has provided unassailable evidence documenting that millions of listeners will be subjected to additional interference on the radio dial should the FCC proposal become a reality," he said.

There was no companion bill in the Senate.

### Double standard

"Kennard's problem is not with the Texas case," said Harry Cole, Bechtel & Cole, Chartered, and RW contributor. "It's the next day when the next guy comes in without Congress behind him. At that point, Kennard will either have to give him what he wants or explain why it was okay to do in Texas but not here."

"The issue of appearances is always educational for those who experience 'press heat,'" said one source who wished to remain unnamed. "I don't think it will happen this way next time."

John King of Haley, Bader & Potts said the situation was "illustrative of independent agencies because they are answerable to congress and the public. Sometimes they get caught in the middle."

Since August 1997 when Lee became CIB chief, the top CIB priority had been shutting down unlicensed FMs, Lee stated in his complaint. The FCC has shut down more than 500 unlicensed operations beginning in 1997 — more than 100 were shut down by court-ordered injunctions or warrants.

Lee has been reassigned to the Office of Plans and Policy where his new title is senior director of licensing and analysis. He did not return calls for this story.

Busting illegal station operators is still going to be a major portion of the activi-

## WHAT COMES AFTER DIGITAL?

In the beginning, there were stone axes. Then came fire, the wheel, and the steam engine. Then came analog audio and then digital audio. What comes next?

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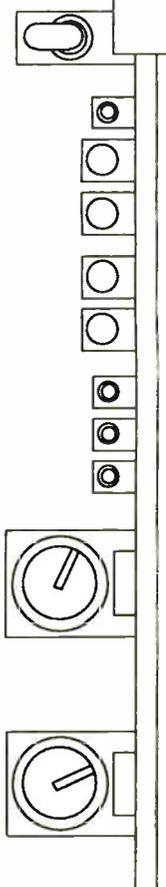
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# How Will Radio Survive?

For my final column before the year 2000, I invited a small number of radio professionals to reflect on this question:

"This week, we are finishing work on the final issue of **Radio World** this century (or, to be technical, the last with a date in the 1900s). As radio approaches the year 2000, what is its single biggest challenge to survive and thrive in the new millennium?"

Here is a sampling of the answers.

★ ★ ★

In my humble opinion, the biggest challenge for radio in the "new order" is to take new developments such as IBOC, Internet opportunities, low-power radio and TV, and



Ben Hill

make them available, through ownership and partnership, to include as many ethnic and demographic groups as possible.

If we do, we can effectively call this country "the land of the free." Today, if you aren't a multimillionaire with Madison Ave. or Washington, D.C. friends, it is very difficult to have a significant stake in these new frontiers. In reality, it is not the "land of the free" (broadcasting).

Ben Hill  
Chief Engineer  
WDAS-AM-FM  
Philadelphia

Radio must stay vigilant yet flexible while developing new and better ways to hold and grow its market share of audience and revenue.

Surviving and prospering in the next millennium means diversifying your modes of marketing to and reaching your audience. That undoubtedly means more than just the traditional over-the-air signal and a Web site.

AM/FM, Internet, cable, DAB, cross-media and satellite delivery will all be on the menu of the winning stations in the future.

Tom McGinley  
Infinity Broadcasting and  
RW Technical Adviser  
Washington D.C.

Radio will have to reinvent itself while meeting new competition in the "all-digital" age: Between Internet radio, music subscription services via cellular networks and my computer synthesizing the ultimately local program: a mix of music and information (from the Net) according to my personal taste, radio might find itself in a niche market.



Karlheinz  
Brandenburg

Digital radio is not the solution, but a necessary step towards services who can survive in the competitive field of future multimedia services.

Karlheinz Brandenburg  
Department Head, Multimedia  
Department  
FhG-IIS A  
Erlangen, Germany

Ed. Note: Karlheinz Brandenburg is the main developer of MP3.

Hello Paul,

My hearty pat on the back for emphasizing your position as to the arrival of the third millennium, and the 21st century. All from Madison Ave. to Hollywood have embraced the number 2000 as an icon, idol and sacred Baal, and are reacting like a bunch of lemmings heading for the closest cliff.

About 20 years ago I wrote a vignette for a now-defunct magazine, indicating that in the year 2025, there would be no more terrestrial radio, all would be satellite

feeds. There would be five very-high-power AM stations for emergency purposes. Television would be all-satellite to direct-to-home, or to feed cable head-ends.

Simply check the constant drop in viewership. I suspect there will be a lesson here, and that is L-band or satellite schemes will permeate the radio medium sooner than our broadcasters of today anticipate.

It is inevitable the next giant technical step for "radio" is 23,000 miles away, straight up. This will afford continuity in program material, as one travels from region to region, and provide the highest diversity of programming available free of terrestrial anomalies.

Jesse Maxenichs  
Broadcast Aficionado, Emeritus

Radio must embrace new technologies to survive. The Internet and CD-quality services will soon dwarf the choice and quality of today's radio.

While good programming and localism will go a long way to preserving market share against other radio competitors, sonic quality will grow in importance.

Gary Shapiro  
President  
Consumer Electronics Association (CEA)  
Arlington, Va.

Radio's biggest challenge will be to preserve its audience base in the face of

Thanks to all who replied. Look for more comments about the future in our Jan. 5 issue, and send your own answers to [pmclane@imaspub.com](mailto:pmclane@imaspub.com)

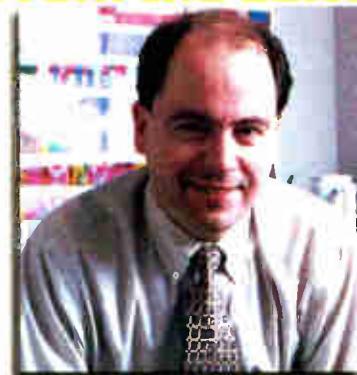
Last, I can now say with confidence that Murphy was an Irishman.

In our Dec. 8 issue, we wrote an editorial on the last page about how stations should prepare for Y2K. Actually, I wrote it. And I had this clever idea:

The last sentences of the opinion piece would read, "So go ahead and enjoy New Year's, with your fingers crossed. We will, too, because we've done a thorough, top-to-bottom check of all critical systems at Radio World.

"Everything seems to be A-OK."

## From the Editor



Paul J. McLane

competition from new media, particularly satellite-delivered program services.

With spot loads already exceeding 15 minutes per hour in some markets, radio is going to be hard-pressed to maintain its cash flow if it starts to lose listenership to services having less (or no) commercial clutter. These problems will be worsened if wireless Internet delivery to autos becomes commonplace, because the Internet will offer a variety of narrowcast services that complement the tastes of individual listeners in a way that mass-appeal radio cannot.

I suspect that current radio owners will have to diversify into these new means of distribution if they are to prosper in the 21st century. As always, content is king.

Bob Orban  
Chief Engineer  
Orban Inc.  
San Leandro, Calif.

Except the last sentence would appear upside down. Get it? Upside down? All systems are Y2K compliant, but the last sentence is inverted? Hah-ha-ha-ha!

That's a joke, I say, that's a joke, son. Unfortunately, when our issue came back from the printer, that last sentence was nowhere to be seen. Poof, just gone. Not upside down, or right-side up, simply MIA.

The gremlins in the production and printing process apparently took it out. Just warming up for Y2K, I suppose. And so our Y2K editorial ended with a somewhat smug-sounding statement that all of our critical systems are in place.

Obviously, they are not. Oh, well. Happy holidays

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# Little LEOs Seek More Spectrum

by Lynn Meadows

**WASHINGTON** Companies that use low earth orbiting satellites — known as Little LEOs — to transmit data are searching for more spectrum to be allocated to their needs — including broadcast spectrum.

More than two years has passed since the FCC asked whether low earth orbiting satellite services — also known as “Little LEOs” — should be allowed to share the spectrum that broadcasters use for remote pickups and two-way communications.

## Three more LEOs

The FCC received 85 comments and replies regarding the rule making.

An FCC spokesman said the Notice of Proposed Rule Making, ET Docket 97-214, is still under consideration. Meanwhile, three new Little LEO companies have received licenses since the release of the NPRM. Those companies and two other Little LEO licensees agreed to share the spectrum currently allocated to them.

But the ambitions of the Little LEO companies almost guarantee that they

will remain hungry for more and more uplink and downlink spectrum.

The companies transmit data in tiny bursts via satellite. Uses planned by the companies include transmitting anything from meter readings to vending machine information, such as whether a soda machine is empty.

According to the commission spokesman, the prompting for the NPRM did not come from a petition from a Little LEO company. Instead, the NPRM issued in October 1997 was a proposal to implement domestically what had been adopted internationally at the World Radiocommunication Conference in 1995.

At that conference, it was agreed that the 455-456 MHz and 459-460 MHz bands should be made available to mobile satellite services worldwide. Domestically, the idea met with skepticism from broadcasters who use the 455-456 MHz band and others who use the 459-460 MHz band.

The primary concern for both is that the Little LEOs will cause interference (RW, Nov. 26, 1997).

North American Plastics Inc. expressed its concern that LEOs would disrupt its in-flight telephone air-to-ground communication system on the 459.665-459.985 MHz band. The NAB stated in public comments that it feared potential program disruption if the Little LEOs used the 455-456 MHz band.

As little as a four to six seconds of interference “is enough of a duration for interference to wipe out a significant portion of a traffic report, news report or any other live broadcast from the field,” the NAB wrote.

Little LEO companies such as Orbital Communications Corp. argue that their dynamic channel assignment techniques will help them avoid using channels actively being used by terrestrial systems. In its reply comments, ORBCOMM also stated that 450 milliseconds is the maximum length for a burst of data from a Little Leo, but a “burst length” of 60 ms is most-common.

The SBE has filed more than 40 pages of arguments against the use of the 455-456 MHz spectrum questioning the Little LEO’s position that they can use dynamic channel assignments without interfering with broadcasters. The SBE also protested the comment by satellite companies that the RPU spectrum is lightly used. An SBE insider said the organization is monitoring the issue for further developments.

Little LEOs already share spectrum with terrestrial services. Their uplink frequencies are 148-149.9 MHz and 149.9-150.05 MHz. Downlink frequencies are 137-138 MHz and 400.15-401 MHz.

Those frequencies were approved for use by LEO satellite systems at the World Administrative Radio Conference in February 1992 and allocated by the FCC to Little LEO mobile satellite services in January 1993. The spectrum is also currently assigned to the Department of the Air Force and the National Oceanic and Atmospheric Administration.

The FCC has issued five Little LEO licenses. VITA (Volunteers in Technical Assistance) is the only non-commercial interest with a Little LEO license. It received a pioneer’s preference award in 1994 and an operational license from the FCC in 1995. VITA has promoted and pioneered communication in development through the use of low earth orbit

satellite access since 1982.

ORBCOMM was the first commercial Little LEO company to receive a license in October of 1994. The company provides global data and messaging. A spokesperson for ORBCOMM recently said her company is not pursuing additional spectrum.



Final Analysis Inc., DBS Industries Inc. and Leo One Worldwide all received licenses in 1998.

## No auctions, please

Frederick R. Skillman, vice president, chief of staff for DBS Industries Inc., said one reason licenses were issued was that the applicants “agreed to play in the same sandbox together” and coordinate their use of the existing Little LEO spectrum. The FCC had been thinking of auctioning the band, he said, and none of the applicants wanted an auction.

Little LEOs operate worldwide, Skillman said, and the companies did not want the United States to set a precedent for other countries to conduct auctions.

DBS Industries will be able to send

500,000 messages per day using its Little LEO system, Skillman said. The primary application will be reading utility meters and vending machines to tell companies when the coin slots are full or the product is empty.

A spokesperson for Final Analysis said spectrum is always an issue. Final Analysis will launch six satellites in 2001, she said, and another 30 in the following two years.

In its reply comments, Final Analysis wrote, “The demand for Little LEO-based mobile data and messaging services is enormous and the market for Little LEO services is both emerging and global in nature.” The company also stated that “Little LEO services have a significant need for additional spectrum to realize their full competitive potential.”

Leo One received its FCC license on Feb. 13, 1998. Leo One is planning a 48-satellite constellation slated to be operational in 2002. Leo One will offer a range of near real-time messaging services including tracking and fleet management, monitoring and remote control, two-way messaging, emergency services and transaction processing.

While the industry awaits the FCC’s decision on the docket brought about by WRC-95, work is proceeding on the WRC-2000. And participants in those preparations are considering requesting additional allocations on a worldwide basis for mobile satellite services below 1 GHz.

## BUSINESS DIGEST

### Mackie, Behringer Settle Suit

**WOODINVILLE, Wash.** Settlements have been reached in lawsuits filed by Mackie Design Inc. against Behringer Spezielle StudioTechnick GmbH. No terms of the agreement were disclosed.

The settlements bring an end to a series of lawsuits and counter suits filed by the parties beginning in 1997. Mackie claimed in federal court that Behringer duplicated the Mackie 8-Bus mixer line, citing “uncanny similarities” between the two products. Behringer ended production of the mixer in question last year.

Samson Technologies of Syosset, N.Y., and New York-based music/pro audio retailer Sam Ash Music were also named in the original patent and trademark infringement suits filed by Mackie. Settlements with Samson and Sam Ash Music were announced earlier this year (RW, June 23).

Mackie originally sought a total of \$327 million from Behringer, Samson and Sam Ash.

In response to the out-of-court settlement with Behringer, Mackie officials stated in a press release, “The parties acknowledge that they are pleased with the outcome of this settlement and look forward to participating in friendly competition in the future.”

Mackie officials declined further comment.

In other news, the audio product manufacturer announced the resignation of Roy Wemyss as company president and chief executive officer in October. Wemyss will remain a member of Mackie’s board of directors. He joined the company in 1996. No replacement had been named by late November.

—Randy J. Stine

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Circle (7) On Reader Service Card

# Dane Ericksen Links SBE, FCC

► DANE, continued from page 1  
member of the NAB/SBE Engineering Conference Committee.

The SBE award recognizes the individual who has made the greatest contribution to the broadcast engineering industry and to furthering the goals and objectives of the SBE.

His full-time job is a senior engineer at Hammett & Edison Inc. in San Francisco, an engineering consulting firm. He has worked for the company since 1982.

## FCC's man in SF

After graduating from California State University in 1970 with a bachelor's degree in electrical engineering, Ericksen went to work in the Field Operations Bureau for the FCC in San Francisco for 12 years.

"It was a great experience right out of school. To work for a regulatory agency is a real learning experience," Ericksen said.

He began as a field engineer and later became an FM/TV specialist while stationed in San Francisco.

"The best part was cruising around chasing unlicensed citizens band operators with linear amplifiers who thought they were radio stations," Ericksen said.

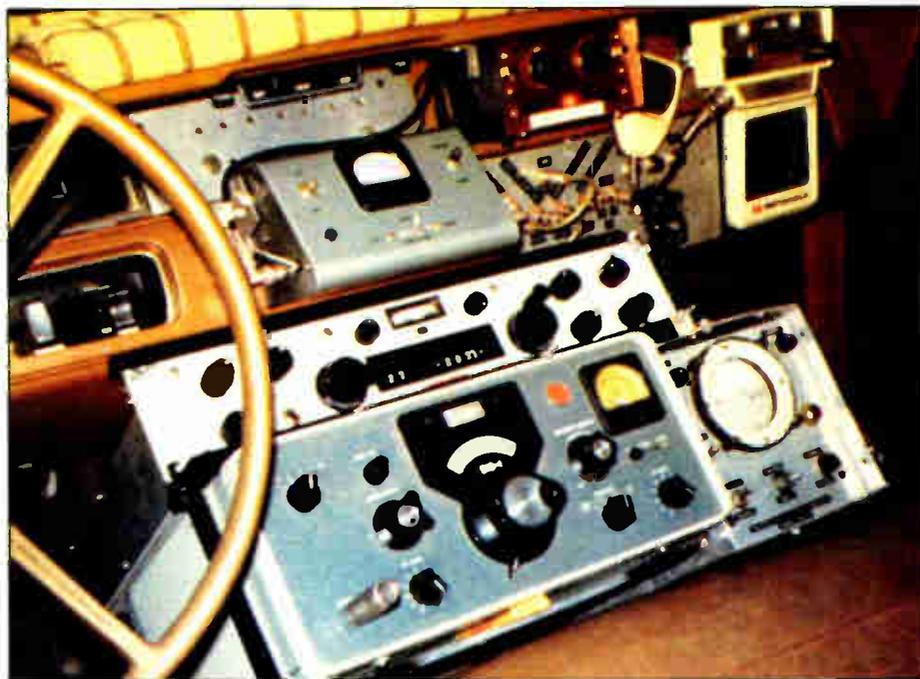
The FCC allowed for a maximum five-watt CB transmitter, but Ericksen said some of the offenders were running between 100 and 300 watts. In one case, he found an illegal 1 kW linear transmitter.

"The guy had it plugged into his 220-volt dryer outlet," Ericksen said.

"These guys were operating in residen-

tial neighborhoods, so they could wreak havoc on regular radio and television reception. It bled through on phone lines. If they were next door, people could even hear it through their electric ranges."

In 1974, Ericksen took the wheel of an FM/TV enforcement unit truck, one of four throughout the entire agency. The truck specialized in FM and television measurements.



Shown is the inside of an early vintage undercover FCC vehicle used for tracking down illegal CB stations.

Ericksen said he drove up and down 13 western states taking power measurements.

"If the off-the-air measurement showed there was a problem, that triggered an inspection," he said.

Today, Ericksen helps stations through his SBE involvement and through his employer.

Hammett & Edison's primary focus is designing AM, FM and television anten-



Dane Ericksen in 1973

nas, saying they would use the frequency allocations when broadcasters are not.

The SBE filed comments with the FCC against the proposal.

Another spectrum issue on which Ericksen is working is a so-called Emergency Radio Data System proposed by Federal Signal Corp. For ERDS, mobile transmitters would broadcast emergency warnings to motorists.

Federal Signal Corp. has asked the FCC to allocate 87.9 MHz, part of the spectrum designated for TV Channel 6, for ERDS.

"It will require new car radios that would monitor 87.9 MHz. It would interrupt whatever the motorist was listening to with emergency data. Good idea for receiver manufacturers, but very poor for broadcasters in general," Ericksen said.

## Channel 6 for FM?

Ericksen believes TV Channel 6 could someday be re-allocated to FM band service as television stations go digital. (The FCC has raised this possibility in its radio DAB Notice of Proposed Rule Making. See RW, Nov. 24.)

"I believe there are only three TV Channel 6 allotments on the DTV table across the country and one has proposed to move already."

The possible creation of a new class of low-power FM's by the FCC is a core concern to the SBE.

Ericksen said he is "very concerned over proposals for low-power FM service. I think there is a lot of political pressure being exerted on the FCC's Mass Media Bureau by the commissioners to come out with a favorable position."

If the FCC allows low-power service with no third-adjacent channel protection and relaxed second-adjacent channel protection, Ericksen said his main concern would be the technical uncertainty of the second-adjacent channel.

"That's because of its preclusion to digital in-band, on-channel and also the question of how well consumer-grade receivers can reject second-adjacent channels," he said. "The (IBOC) proponents' theoretical estimates are trying to make it work."

However Ericksen is not totally confident of the viability of IBOC DAB.

"I have my doubts still. It depends on whether the FCC adopts a platform and then what the broadcasters do. It's the second go-around, and maybe the last chance," Ericksen said.

Satellite-delivered DAB could eventually prove to be a big source of competition for terrestrial radio stations, Ericksen said.

"If what we hear coming out of Detroit is correct — that they are now building most cars with built-in rooftop antennas whether the consumer orders it with that capability or not — then it

See DANE, page 7 ►

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nas. It specializes in optimizing coverage, allowing stations to target power increases to select areas, as opposed to simply maximizing area served.

Hammett & Edison's clientele come mostly from medium and major markets. Ericksen said the firm often is asked to help with improving signal coverage.

"We use a program called TIREM (Terrain Integrated Rough Earth Model). It's especially useful in booster design for FM," Ericksen said. "It's easy to shoot yourself in the foot with a booster because you can create more new interference instead of helping yourself."

TIREM was developed by the military to predict RF propagation. Ericksen believes Hammett & Edison is the only company using the technology.

"The beauty of TIREM is that it can accurately look at terrain obstruction and determine if there is enough isolation to the under-served area, so that if you put in a booster you can gain more new service and less new interference," Ericksen said.

## RPU spectrum threat

Aside from helping stations obtain better coverage, Ericksen is working to ensure the integrity of broadcasters' signals through his SBE involvement. He mentioned several technical issues now before the FCC that he believes pose a danger to radio's future.

"The threat by mobile satellite services into the 455 and 456 MHz spectrum is a real concern," Ericksen said. Radio stations use the frequencies for remote broadcasts and two-way communication (see related story, page 5.)

The FCC is reviewing the request for satellite service uplinks in the spectrum as part of Engineering Technology Docket 97-214.

The low earth orbiting satellite service industry would like to share the frequen-

► **NEWSMAKER**, continued from page 6  
 could be competitive, if people are willing to pay extra for it," he said.  
 Ericksen spends a lot of his time on SBE committee work.

**SBE involvement**

"I'm fortunate enough to have an employer who will let me travel and serve the SBE in various capacities," Ericksen said. "It's something I believe in passionately and take very seriously."

As chairman of the FCC liaison committee, he must address all national-level SBE comments to the FCC and other regulatory bodies.

Overall, Ericksen finds working with the FCC under Bill Kennard more "radio and television friendly" than Reed Hundt's administration.

As a member of the 12-person NAB/SBE Engineering Conference Committee, Ericksen helps determine the theme for the NAB's Broadcast Engineering Conference.

"We'll go through some 150 to 200 abstracts of proposed papers and select which ones should be accepted and which sessions they should be assigned to," Ericksen said.

The committee meets two to four times a year in Washington.

Ericksen sees changes in the industry as a whole as consolidation occurs among stations and their suppliers.

When asked if radio consolidation can continue at the same intense pace, Ericksen said, "I see it continuing. The clout it gives the major groups will encourage more of the same."

He predicts the industry will see additional arrangements between broad-

casters and suppliers similar to what the Broadcast Division of Harris Corp. has done with master purchase agreements.

"The vendors will want to pursue these customer-friendly deals to lock-up a certain amount of business," Ericksen said.

Ericksen said he expects to see more broadcaster-supplier marriages, similar to Cumulus Media's acquisition of Broadcast Software International this past September.

"It worries me some, though, that the industry is becoming a bit monopolistic," Ericksen said. "The 800-pound gorilla is fast becoming a 2,000-pound Godzilla. It won't take long for the Justice Department to become interested."

Ericksen is single and lives in Sonoma. He has two children from a previous marriage.



Ericksen Conducting RFR Measurements at the Mt. Wilson Antenna Farm Near Los Angeles

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**What His Peers Say**

I first met Dane in the late '70s in the lobby of KMJ-TV, Fresno, Calif., when he was the local FCC inspector. The announcement that the FCC was in the lobby sent shivers down my spine!

I must admit, Dane was tough, but fair.

— Bob Hess

Director, Operations/Engineering  
 WBZ(AM), WODS(FM), WBZ-TV  
 Boston

Our profession and SBE have benefited from Dane's experience. You name the subject, if it has something to do with the FCC, Dane was there to draft a response.

Working with Chris Imlay, SBE has become a very strong voice of reason and a voice that is listened to in Washington.

— Clay Freinwald

Senior Facilities Engineer  
 Entercom Communications Corp.  
 Seattle

Dane ... is creative and never accepts anyone's representations without independent evaluation of his own.

Woe be to him who disagrees with Dane, because (a) he is like a bulldog, never letting go of an issue, and (b) he is, in my experience, almost always right. He has ... infinite patience with people, even non-technical people, which is what makes him a great friend.

— Chris Imlay

SBE General Counsel  
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### Entercom, Inc. Chooses BE

Entercom Inc. chose the **Broadcast Electronics Inc.** AudioVault digital studio and NewsBoss systems to serve its eight radio stations in Seattle, including the top news station in that area.

Entercom also purchased an AudioVault and NewsBoss system for its Kansas City, Mo., radio market.

AudioVault features selectable sampling and audio compression rates and modular architecture for single-station operations as well as for systems using digital networking. The design uses advanced digital signal processing, AES/EBU, SCSI and programmable gate array components.

NewsBoss is a newsroom system with a database that assures reliability and flexibility. Features include wire capture, word processing, audio connectivity, on-air presentation, audio editing and WAN connectivity.

Entercom also is using the WAN to

relay stories and actualities to its stations in Seattle.

For information, contact **Broadcast Electronics in Illinois** at (217) 224-9600, visit the Web site at [www.bdcast.com](http://www.bdcast.com) or circle Reader Service 111.

### Netia Upgrade Down Under

The **Australian Broadcasting Corp.** is going digital with Netia.

The project, which began in September and is expected to last 16 months, involves the replacement of more than 400 digital audio workstations at some 51 locations.

Tests of products from several manufacturers were conducted before the public broadcaster decided to go with Netia, which is represented in Australia by Syncrotech Systems Design.

Netia Radio-Assist products are software tools for acquisition, production, live transmission and on-air

automation.

For information from **Netia Americas**, call the company at (877) 699-9151, visit the Web site at [www.netia-broadcast.com](http://www.netia-broadcast.com) or circle Reader Service 72.

### Sirius Installs Huge Storage System by PSI

**Prophet Systems Innovations** announced the installation of its new NexGen Digital Broadcast system in **Sirius Satellite Radio's** new National Broadcast Studio in New York.

PSi called it the most advanced digital audio storage and routing system ever designed, customized to support Sirius' 100-channel digital audio radio subscription service.

Sirius recently changed its name from CD Radio. The facility was profiled in RW's Nov. 10 issue.

NexGen Digital Broadcast is a programming control center that stores and processes audio data for radio stations. The Sirius system is one of the largest completely digital audio storage system installations in the world.

There are no analog signals, either audio or contact closures, used in the NexGen system. All audio is AES digital, and all contacts are embedded in the AES stream using AES3-18 specifications.

PSi will equip Sirius Satellite Radio with the technology to store and process content for up to 100 channels of music and other programming, to be beamed throughout the United States via satellite to vehicles equipped with the company's receivers.

The system's digital storage capacity will be approximately 1.7 terabytes of music and assorted programming elements, using HP's fiber optic technology, Xeon CPUs, high-speed SCSI drive arrays and more than 150 Pentium II 450 industrial workstations.

The Sirius Satellite Radio system also uses a unique four-play, one-record card with synchronization to interface with a digital 512 x 512 AES router.

PSi President and CEO Kevin Lockhart said Sirius is undertaking "one of the most ambitious projects ever in

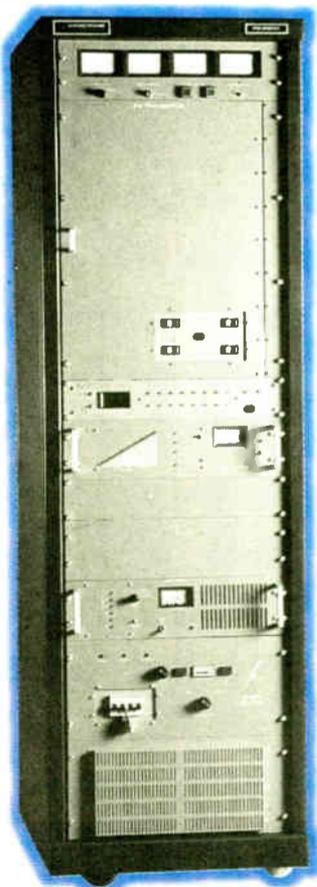


Inside the New Sirius Satellite Radio

radio broadcasting. ... Until recently, the technology and software needed to run a system of this magnitude was not available."

For information, contact **PSi in Nebraska** at (800) 658-4403, visit the Web site at [www.prophetsys.com](http://www.prophetsys.com) or circle Reader Service 121.

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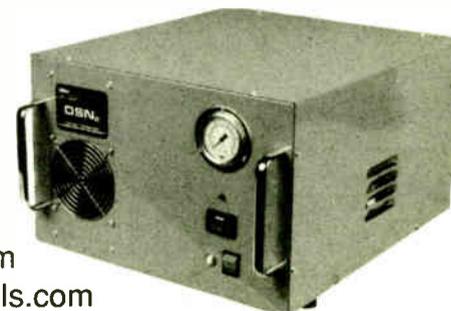
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**MDS-E58 – Sony's Economical Professional MD**

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Sony's MZ-R55CG is so tiny and lightweight, it's probably the handiest MD recorder you can have with you, either as a primary or backup device. Smart features include the wired remote control, sample rate converter and 40 seconds of shock resistant memory for skip-free playback. Headphones included. An optional XLR to mini-plug cable is available through BSW.



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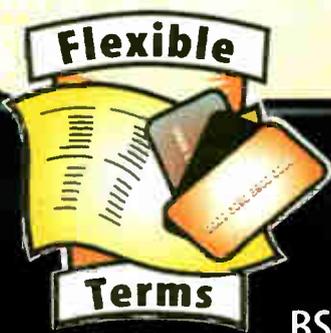
Sony's industry standard MDS-B5 recorder/player and MDS-B6 player offer the "big market" performance you seek, with the durability to last for years. Multi-access "Hot Start" for up to 10 tracks makes it an excellent on-air source. Other features include RAM-TOC editing for saving master disc contents, PC keyboard input and RS232 interface, next track select and variable speed control.



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# Internet Effect Hits Collectors

## Ed Ritchie

John Pelham loves vintage radios. In fact, after seeing his Internet Web site at [www.radiophile.com](http://www.radiophile.com), you might think he's obsessed with them.

More than 3,000 people visit Radiophile.com each month, so Pelham knows he's not alone. Phil Rheinschild also collects antique vacuum tube radios. Although he says it's not an obsession,

ness without the Internet.

What's the connection for these three enthusiasts? Their Web sites have pushed them out of obscurity, and the Internet is promoting their hobby to a newfound audience.

## Labor of love

"Without the Internet I wouldn't have even been tempted to start a business," Stambaugh said. "It would have stayed



John Pelham

since 1963 he has owned, repaired and sold more than 1,000 radios.

Now just in case that fails to demonstrate more than a mild interest, he too has a Web site, at [http://home.pacbell.net/philbert/tuning\\_eye/tun\\_eye.htm](http://home.pacbell.net/philbert/tuning_eye/tun_eye.htm). It's dedicated to the somewhat offbeat subject of tuning eyes.

Scott Stambaugh is another vintage radio junkie. He used to be a serious collector but then he started [www.RadioGallery.com](http://www.RadioGallery.com), a successful Web site selling antique radios. Yet he never would have considered such a busi-

ness strictly a part-time hobby. There just isn't any way to reach these people as effectively for this kind of product."

Vintage radio collectors aren't the only ones with an interest in radio taking advantage of the Internet. Hundreds of digital radio stations are now broadcasting exclusively online. The low startup and overhead let station operators target niche markets that traditional broadcast radio can't afford to do.

Yet Stambaugh isn't tuning into anything digital. It's the old vacuum tube

technology that captivates him. Stambaugh haunts antique shops in the heart of the Pennsylvania Dutch country and finds classic radios for restoration.

"The Internet established me overnight and gave me a quick reputation," Stambaugh said. "It's something I could never have achieved by opening a shop where I live in Lebanon, Pa."

But even though the growth has been rewarding, running around Dutch country (or any other country for that matter) is still a lot of legwork. And before the Internet, that's what vintage radio collecting used to be.

## The old days

Phil Rheinschild remembers collecting vintage radios in the 1960s and '70s.

"Prior to the Internet you had to work a lot harder," Rheinschild said. "You were running into thrift shops and second-hand stores, also swap meets or garage sales." Other legwork included a lot of time networking with people and radio clubs that could aid in the search.

"It was fun, but it was a random process that was loosely organized," he said.

**There are many more radios available every day on eBay than were available to most collectors in a year of swap meets.**

— John Pelham

Of course the radio clubs had swap meets that quickly taught Rheinschild where to look for bargains. "There were collectors who had fixed up their radios and were asking outrageous prices for them," Rheinschild said. "But sometimes

there were people who had cleaned out their garages, and occasionally you found something at a reasonable price."

Then the Internet and the Web made radios more accessible. However, it also made them more expensive.

"I'd say radio collecting online began around 1993 in a small way, and by 1996 the eBay online auction hit, and sets were being snapped up for outrageous prices," Rheinschild said. "I thought people who were Net-savvy were going to go to all the meets, snap up all the sets, and make a killing."

According to Rheinschild, it was a seller's market through early 1998. Then the prices started to return to pre-Internet levels.

"Those people who were rabid about getting a particular set saw that those sets continued to appear for auction, so that perceived scarcity disappeared," Rheinschild said.

## Auction block

John Pelham might be considered a rabid collector. At Radiophile.com, he proudly displays one of the best radio collections to be found on the Internet. Pelham sees eBay as probably the biggest single Internet influence on radio collecting.

"There are many more radios available every day on eBay than were available to most collectors in a year of swap meets," Pelham said. He said eBay has affected opinions as to which radios are common and which are rare.

"eBay has caused most of us to re-evaluate our opinions on this subject," Pelham said. "I, and other avid collector friends, review eBay almost daily. We have learned that some radios that we thought were rare — the plastic Satchell-Carlson 'frog-eye' radio, to pick one of many examples — really are not rare at all."

Pelham agrees with Rheinschild and Stambaugh about how the Internet has helped radio collecting reach a new audience.

"Many collectors first learned about the hobby through the Internet sites, and are now buying radios online and through the various venues," he said. And he's sure that the Internet has accelerated the interest in vintage radios when compared to the traditional means of collecting.

"I have only been collecting for a few years," Pelham said, "and the Internet has allowed my collection to grow enormously, with radios I might have never even had the opportunity to buy at swap meets."

■■■

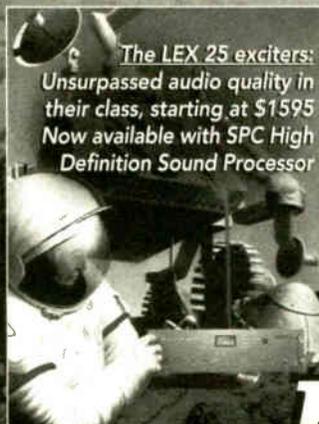
*Ed Ritchie is a free-lance writer and radio collector.*

*Tell us about your experiences with trading vintage radios online. Send e-mail to [radioworld@imaspub.com](mailto:radioworld@imaspub.com) or write to the address on the inside last page of this issue.*

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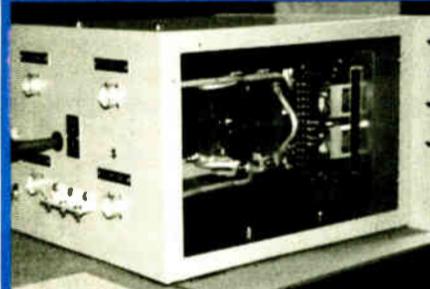
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## Supplier Consolidation

► SALE, continued from page 1  
Harris Corp. in Melbourne, Fla.

Days later, Harris announced it will acquire Louth Automation. That cash deal will total about \$85 million.

Although Louth is known as a television supplier, the purchase could have an impact in radio, according to Harris executive Bruce M. Allan.

"This acquisition will give us essential new core competencies in automation and control," he said.

Harris named Don Naab, vice president, automation and management products, to head the business unit. Naab is former president and CEO of Pacific Research & Engineering, which was acquired by Harris this year. Founder Ken Louth will serve as chief technology officer.

The main reasons for the ABG deal, according to Harris Radio Broadcast Vice President Jim Woods, were ABG's strengths in certain regions of the United States and the experience of its sales force.

"People who know the market and the customers are very difficult to find," he said.

ABG employs 18 people. Seven will remain with Harris.

lower" sales and gross margins in the microwave radio and digital switch lines offset "modest improvement in sales and earnings" for its broadcast products.

In fiscal 1999, Harris revenue decreased 9.4 percent to \$1.74 billion. Sales at the Communications segment decreased 4.5 percent to \$930.3 million. Broadcast business is part of that segment, but specific figures are not made public.

Woods said ABG's annual sales are approximately \$12 million.

### Supplier chess

Woods said decisions had not been made about which of ABG's supplier relationships Harris would seek to retain. Among the apparent conflicting lines are Nautel transmitters and Dalet audio management systems. Harris builds its own RF products, and has a major distribution deal with Enco. Woods said he expected those lines would not be retained, but others would be evaluated.

The Harris deals open a window into the jostling behind the scenes in the supply industry, as manufacturers and distributors scramble to increase growth.



Dave Howland and Phyllis Freeman of ABG

Howland, working in Michigan, becomes Harris national sales manager for digital audio systems. Also staying are salespeople Cindy Edwards, John George, Tony Mezey, Jerry Bufka and Steve Ellison, as well as customer service representative Shannon Halladay. They will work in field offices and at the new Harris facility in Ohio.

The purchases take place against a backdrop of change at Harris.

The parent company wrote in its annual report that it is "transitioning from a four-business, decentralized enterprise into a single communications equipment company focused on worldwide markets for voice, data and video."

Several years of slow overall sales growth had been followed by faltering earnings in fiscal 1998 and 1999. Harris blamed a downturn in the semiconductor market, lower prices for office products and international market conditions.

It decided to sell its power semiconductor business and spin off its Lanier Worldwide subsidiary, which together accounted for about half of its revenues. Proceeds, it said, would cut its debt by more than half and increase cash by approximately \$500 million. That has created a pool of money to repurchase shares and expand through acquisitions.

The parent company this year streamlined its "sector" structure and reduced support functions. It announced a reduction in workforce of 738 employees and said it is investing in a Web and e-commerce presence.

The annual report said "significantly

Radio itself is healthy, they say, but the number of stations is relatively fixed, and the pool of owners continues to drop.

For Harris the answer is to buy. In 1997 it bought Northeast Broadcast Labs and French company ITIS. In 1998 it acquired Intraplex. This year, it purchased The Audio Connection, an integrator in the United Kingdom, then Pacific Research & Engineering before acquiring ABG.

### Four decades of ABG

ABG was founded in 1960 by Dave Veldsma and Jim Kaminga. After the latter's death, Freeman said, the company had several owner partners. Freeman joined in 1970 and later became a partner with Veldsma, and they ran the company for years. Howland joined in 1972, and became a partner in 1992 with Freeman, buying out Veldsma.

A division dealing with commercial sound and installation was sold in 1979.

President Phyllis Freeman had been planning to retire, and said she was "pleasantly surprised" when Harris approached ABG. But rumors circulated for at least a month before the sale, and Freeman had to remain mum because of non-disclosure rules. She called it a very difficult period.

"It's hard not to take those phone calls."

She said her experience at September's NAB Radio Show in Orlando was a "clincher" in making the decision.

"I spent time talking to vendors and competitors of ours about things happen-

ing in the business. A lot of companies are looking to sell."

"I wouldn't be surprised to see a lot more partnering," said Howland, who had been ABG's vice president of sales and marketing. "Harris has the strength to do that kind of partnering or consolidation. I think they hurt us when they took on Enco. We took on Dalet, but the line doesn't have the same penetration. What would that lead to, and what would we have to work with?"

### Industry comment

Because of its size, Harris is watched closely by competitors.

Tim Schwieger, president of Broadcast Supply Worldwide, sees an opportunity for other dealers.

"The end users are getting less and less opportunity for product selection. BSW and companies like us offer selection. We're not a manufacturer, we're a store," he said.

"We offer competitive lines and choices. Harris is a console manufacturer, they're an STL manufacturer. They are primarily concerned with their own needs. We're concerned with our customers' needs."

Gary Snow, president of Wheatstone Corp., reacted in similar fashion. Wheatstone had had a business relationship with Harris that ended when Harris bought PR&E.

"Harris will be the biggest organization with a systems integration group, and the smallest selection of major components. If you want to have Harris stuff, that's good. If you don't want Harris stuff, it's not good. ... What Harris has is a big toolbox with not many tools in it. They'll be a one-trick pony in consoles, in hard-disk automation, probably in routing switchers.

"Harris was competing with PR&E for systems, it wanted to be in that business and the only way they could do it was buy a company that does it," Snow said. "ABG was one of the few companies out there that marketed themselves as a systems integrator. They get to take them out.

"In my opinion, the sum of Harris' acquisitions never equals the parts," Snow said.

Woods said the market still offers many choices.

"We believe customers are looking for integrated, end-to-end solutions in addition to the 'box' solutions that they have historically come to distributors for."

He said Harris actually entered the systems business with its acquisition of Northeast Broadcast Labs. "We went from 'not in that business' to No. 2 in the United States in less than a year." The PR&E deal, he said, was an opportunity to extend that capability.

Woods said Harris had received positive comments from its customers, who see these moves as natural fits.

"Our customers see Harris doing the exact same thing that their companies are doing. We are expanding the range of offering which we can deliver to our customers — one-stop shopping."

But Schwieger of BSW sees reason for pause in the ABG deal.

"These subtle changes are becoming major changes. Here's a 40-year company that has just vaporized. It's gone, it ceases to exist. In any other industry, I think that would be profound. I worry that our senses are beginning to be dulled."

Broadcasters still have choices today, he said. "But who knows what will happen in the years to come."

# Millennium Radio, Way Down South

Judith Gross

On Dec. 31, as hundreds of thousands of revelers gather in public squares to count down to 2000, one audio artist will sit in a remote, ice-entrenched outpost near the bottom of the world.

He will be working microphones, RPUs, mixer and ISDN signals to bring the sounds of the Antarctic to a radio audience in the United States and Germany.

"Most people think of visual things when they think about a particular location," said Doug Quin, composer, naturalist and wildlife recorder. "Through a composition of sound, I hope to impart a different sense of this unique place at this historic moment in time, and help the audience reflect on what it means to be a part of the entire planet."

Quin has been dubbed the "Audubon of Audio" for his soundscapes in places as far away as Madagascar and the Amazon jungle. His live and recorded programs have been aired on radio networks throughout the world.

Now Quin's "Antarctica — Ice 2000" is part of the National Science

and other whales.

Because the land's glaciers are in constant motion, additional pops, clicks and motion sounds made by the huge ice masses will be included, as will the omnipresent wind. To add another dimension, Quin plans to construct a sculpture from harp, piano, harpsichord and guitar strings, which the wind will musically "play" as it rushes through.

Strangest of all, however, will be the sounds of atmospheric "whistlers" —

See MILLENNIUM, page 18 ▶



Quin records seals in Antarctica.

Photo courtesy of James H. Barker

Quin has been dubbed the 'Audubon of Audio.'

Foundation's Antarctic Artists and Writers program, which gave Quin the funding for a three-month odyssey tackling the harsh Antarctic climate amid sparse transportation and minimal communication facilities for the purpose of broadcasting live on the eve of 2000.

With equipment donated by broadcast vendors and manufacturers and a commitment from National Public Radio and WDR in Cologne, Germany, to air the program, Quin plans to blend environmental, atmospheric, animal and original music sounds into a one-of-a-kind audio experience.

## Whales, seals and 'whistlers'

"Many people visualize Antarctica as nothing more than ice, but the sonic palette includes a diverse range of sounds — everything from whales to atmospheric phenomena," said Quin, who will station his headquarters at Palmer Station, a research facility on an icy, glacial coast some 1,400 miles from the South Pole.

Quin plans to set up microphones at several sites to record a penguin colony and the large Weddell seals, leopard seals and crabeater seals, to catch the "language" unique to each species. He also will employ hydrophones — underwater mics — for the call of Orca

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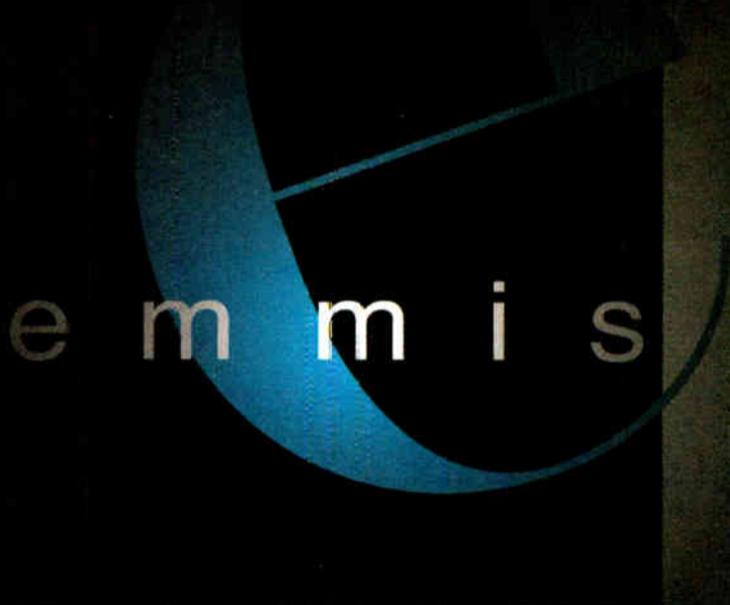
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## PRODUCT EVALUATION

# Optilator Protects Phone Lines

Jay Crawford

If you are one of those who rely on some type of dial-up remote control to operate your transmitter, you have likely had some problems with lightning on the telephone line. This is a story about a product that can help you, called the Optilator.

We have eight transmitter sites across three states, all controlled by dial-up remote controls. We have fought the problems caused by lightning entering the operation on the telephone lines, and have tried many different types of surge suppressors.

Some of the best have worked as "phone line fuses" — opening up the line and doing little damage to the actual remote control equipment. This is a problem, because you then are unable to control or monitor your transmitter site until someone travels to the remote location and replaces or repairs the surge protector.

After one recent incident in which we spent nearly a week repairing equipment damaged by lightning, I called the manufacturer of our remote controls.

In the past we have relied on the technical support from Gentner Communications, and they have given us a lot of good information on everything from special "tricks" with remote controls to which surge protectors helped in which cases.

This time the technician I talked to recommended a product called the Optilator, and gave me the name and phone number of its distributor.

## Line isolation

I called immediately to find out just what this device with the strange name would do for us.



The Optilator

What I found was that the Optilator is a line isolator rather than a regular surge protector. The device is built in a plastic box, with two circuit boards inside, one at either end of the box. The "incoming" circuit board is powered from the telephone line, and converts incoming and

outgoing signals into a form that drives and receives from two short lengths of fiber optic cable.

These cables, one for signals passing in each direction, connect to the circuit board at the other end of the box. That circuit board is powered by an isolation step-down transformer type external power supply, and connects to the local

telephone-type equipment. This gives you total isolation with no metallic connection between the telephone line and the telephonic equipment.

The only connections are two pieces of fiber optic cable, approximately four inches long. As far as lightning is concerned, it is looking for the path of least resistance to ground, and it does not exist any more.

We installed one Optilator at our transmitter site in Manistee, Mich., earlier this year. This site has been our worst for lightning problems. Grounding likely is marginal due to the largely sandbox texture of the soil in that area.

## Solid performance

Over the past three years since we built that transmitter site, we have routinely had to replace one or both of the surge protectors on our Gentner VRC-2000 remote control. Often we have replaced protectors after every minor storm. Since installation of the Optilator, we have had several major thunderstorms and we are still operating without a failure.

I realize a few months does not prove that any type of protection equipment is working, but this is by far the best we have done with that site.

There are only two minor problems that I have found with the Optilator. One is that you need to run the power supply on a UPS or you won't be able to get through to your remote control if there is a power failure. In our case this meant we needed a slightly larger UPS than what had been powering the remote control. (A \$150 450 VA UPS designed to fit the requirements of the Optilator is available upon request.) If you don't use backup power for your remote control this isn't a problem. When the power returns to operate your remote control, you would have power for the Optilator anyway. We prefer to be able to "talk" to the remote control to determine what is happening, even if we don't have power to operate the transmitter.

The second problem is the cost, which at \$200 plus \$150 for the UPS is nearly four times that of the surge protectors we

## Product Capsule:

Runnels  
Electronics Optilator

### Thumbs Up

- ✓ Isolation between the phone line and equipment, protecting modem or telco gear from a lightning hit
- ✓ Improves or corrects performance regarding telephone ring or signal loss provided by telco company
- ✓ Real fiber optics at a low price compared to long runs of fiber optics
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### Thumbs Down

- ✓ Need to run the power supply on 450 VA UPS
- ✓ More expensive than surge protectors

For more information contact, Stormin Protection Products Inc. in Florida at (888) 471-1038 or (727) 548-5418 or circle **Reader Service 95**.

had been using. But this thing actually works and doesn't appear to need to be replaced repeatedly.

So what is it worth to be able to know you can communicate with your transmitter? And what does it cost to get someone out of bed to go check your station (and replace a \$50 surge protector)? I think it might cost more for labor, overtime or replacement.

## Expert source

The Optilator is built by Runnels Electronics in Florida. We bought our Optilators (yes, we have installed two so far and plan for others in the near future) from Stormin Protection Products Inc., also in Florida.

Their literature sent with our Optilators indicates these people deal with lightning and reducing its impact on electronic equipment as their main business. Contact information appears in the accompanying box.

I found the installation instructions to be complete, including some common-sense things that might get missed by a first time installer.

Such things include mounting the Optilator in a manner where there is no metal bridging the two "ends" — why give lightning a path to jump across your "isolation"?

Also keep the wiring separated. It is nice to cable-tie all the wiring together so it looks neat, but that shouldn't involve bundling the incoming telephone line with either the telephone line going to the "other equipment" or the power supply wiring. Again, why give lightning a short gap to jump to get to what you are trying to protect?

I hope this information can help anyone with some of the same problems we have had in the past. Every great "discovery" I have had in this business has come from someone else passing along what they have learned.

The main thing I have learned from many years in the broadcasting industry is that if you ask the same questions enough times you will find someone who can answer them. The people who build and repair the equipment we use are a great source of information on how to best use their equipment.

Jay Crawford is chief engineer of WYXU(FM) in Cincinnati and the X-Star Radio Network.

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GUEST COMMENTARY

# Bill to Ban Low-Power FM Scary

Bill Turner

A bill has been introduced in the House of Representatives to make it illegal for the Federal Communications Commission to establish any low-power radio service in the future. This is "The Radio Broadcasting Preservation Act of 1999," House bill H.R. 3439 (see Newswatch, page 3).

Its original sponsor, Rep. Michael G. Oxley, R-Ohio, claims a low-power FM radio service will cause interference to other radio stations and make it difficult for the elderly and poor to receive their favorite radio stations. He says full-power stations will be worth less if LPFM is granted, and says LPFM proponents can use the Internet, start a publication or buy time on a radio station.

### Living and breathing radio

This bill scares me.

I'm a 44-year-old radio nut. I'm no different from probably half the people in the business. We're a strange breed. We don't worry too much about the size of the paycheck as long as we can serve the community our station is licensed to.

I played records and announced to a pencil in first grade. I was on the air with a Part 15 radio station by sixth grade and kept it going for years. No drugs and booze for me, as my micro radio station kept me busy. I love radio.

In 1975 I was a volunteer at a "community" station. By 1978, I was working full-time in radio.

I'm pretty fortunate. I can jock, program, handle sales and management duties and can do some real simple engineering tasks.

I've saved lives of patients at local hospitals when a rare blood type was needed. I've saved people from injuries and possible death with timely weather broadcasts. Almost everyone in the business has as well. It's our job to serve our communities.

I take radio very seriously. I take the FCC just as seriously as I do the IRS. To

me, they hold the right to let me work my chosen career.

To the supporters of this bill, I have a few questions that I feel need answering before this bill comes to a vote.

### Don't limit opportunity

Please explain how the bill would help dedicated broadcasters like myself in seeing their lifelong dreams materialize.

Please explain why Congress would

tions would drop if a low-power radio service was created. Chicago and Detroit both have "grandfathered" low-power FM stations (10 watt stations). Explain how the presence of these stations has lowered the value of the other stations on the dial.

Please explain how without LPFM underserved communities would be served better by current stations.

Please explain how communities with no local radio service benefit by this bill.

## I challenge Congress to find real answers to these questions before voting on this proposed law.

support a bill that effectively prevents taxpaying, loyal, law-abiding and voting citizens the opportunities in their chosen careers that are afforded in other industries.

How will low-power FM stations cause interference when translator FM stations do not? (They have 250 watts or less and rebroadcast stations.)

Does the FCC license radio stations that interfere with other licensed stations? If so, when?

If interference did occur in the unprotected signal areas, please explain the social impact and the economic impact it would have on the station that loses the unprotected coverage area.

If the owners of older radio receivers will find it difficult to tune in their favorite radio station if low-power FM is allowed, then explain how translator stations don't cause reception problems. Will digital FM affect these people? How about digital TV?

Who determined interference would exist? Was it actual or theory?

The bill states the value of radio sta-

tions. How many stations do this?

In Houston, of 68 stations, five will once you meet their format guidelines. A wait of months or even years to buy the time might occur. How does this help Sanderson, Texas, and other towns?

Low-power FM can work! In a town of 1,200, the first radio service for this town operates at a low power. The town loves the station and the station turns a profit. They could go to 100,000 watts, but serving their community and making a profit seems to be a better option.

Frequently the investment required for radio is so great, the operator must hook up to a satellite service, run no local news or high school sports, etc. in order to service the debt. How does such a station provide better service than the low start-up cost of the LPFM?

In major cities, LPFM would probably be restricted to neighborhoods. Owners might be community or church groups or a radio person. Funding would be by selling advertising to mom-and-pop businesses that couldn't even afford to buy one commercial on a big FM station.

Newspapers and cable TV divide major cities into sections in order to provide affordable advertising rates to small businesses. With LPFM, radio could provide the same.

I challenge Congress to find real answers to these questions before voting on this proposed law.

■■■

The author is station manager of KYND(AM) in Houston.

RW welcomes other points of view. Write to the address found on page 52.

No radio signals reach Sanderson, Texas, and its economic base is too small to support a full-power outlet.

Ask Dudley Harrison, County Judge, about the flash flood he survived. Would the death toll be lower if radio had been there?

### Little time available

Oxley states that the proponents of LPFM can purchase time on radio sta-

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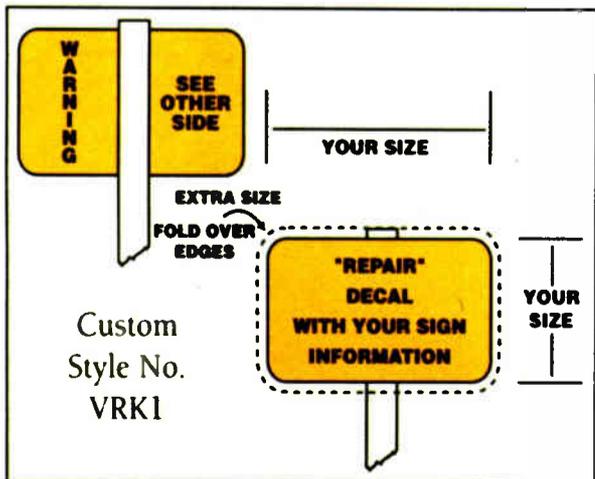
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# Live Sound From Antarctica

► MILLENNIUM, from page 15  
Very Low Frequency sounds that actually emanate from outer space.

"Lightning strikes and other phenomena make a sound which resonates back to the poles from space," Quin said. "At Palmer Station, a VLF receiver picks up these sounds and a transducer puts them into hearing range, kind of a whistling effect. I'll include them in the broadcast as well."

Because transportation to the Antarctic is infrequent, Quin's visit will last three months, during which time he will camp in a tent and travel by Zodiac boat, bracing the region's summer temperatures that range from 32 down to 0

degrees F. His "studio" will consist of the equipment he has assembled.

"An important consideration was having sufficient back-up gear in case there's a problem. There are no overnight delivery services, and mail drops are few and far between. I needed reliable equipment right from the start," said Quin.

For the broadcast, Quin will set up simultaneous live feeds from mics placed in strategic locations, including an FM Wireless system, an M/S recording system and a shotgun mic, all donated by Sennheiser, plus International Transducer Corp. hydrophones to pick up underwater sounds.

The hydrophone array will send a signal back via RPU to the base at Palmer Station where Quin will be stationed.

Sounds made by his "wind harp," as well as the VLF atmospheric noises, will be mixed into a Mackie board along with the mic feeds. Quin's narration and a DAT tape with recorded material. That signal will be fed into an MPEG Layer 3 Zephyr ISDN codec donated by Telos, and compressed into a 64 kbps stream.

Because there are no telephone communications on Antarctica, the encoded audio will be fed to a portable Inmarsat B Terminal donated by Commercial Satellite Systems. It will be sent up to Inmarsat B

## Key Components for 'Antarctica — Ice 2000'

**Sennheiser Microphones:**  
FM Wireless System  
w/ SK250 transmitter and  
EK-3041-U receiver  
M/S Recording System w/MKH 30  
and MKH 40 mics  
MKH 815 Shotgun mic

**International Transducer Corp.:**  
6050C Hydrophones

**Rycote:**  
Windjammer wind and noise  
dampeners

**Telos Systems:**  
2 Zephyr ISDN codecs  
(one back-up)

**Commercial Satellite Systems:**  
Satlink B2 Portable Inmarsat  
B Terminal

and downloaded by NPR and WDR.

Satellite channel limitations dictate that the live feed will be mono, but Quin is planning to produce recorded programs in stereo for later airing.

NPR is planning to carry "Ice 2000" live from Antarctica on its New Year's Eve "All Things Considered" broadcast.

WDR in Germany will broadcast Quin's program live as the year 2000 begins, starting at 11 p.m. local time on Dec. 31.

**Quin estimates a combined audience of more than 40 million listeners, worldwide.**

In addition to the live broadcasts, Radio New Zealand will air Quin's recorded program on Sunday Jan. 2. Quin also will post his Antarctic soundscapes on the Internet, and they will likely become the basis for an addition to his list of original CD recordings.

For the radio broadcasts, Quin is estimating a combined audience of more than 40 million listeners, worldwide.

And as far as seeing in the year 2000 in what could rightfully be called the most remote place on the planet, Quin says it's a great way to celebrate the "diversity of life and the wonder of the Antarctic."

"It seems like the right place for the millennium, it's fascinating: the sounds of life there will raise our consciousness and provide a great opportunity to reflect on our relationship to one another and the natural world."

■ ■ ■

*Judith Gross is a former editor of RW. She is a free-lance writer.*

*The photo that accompanies this story is courtesy of James H. Barker, a free-lance photographer who has twice been chosen to travel to Antarctica to participate in the National Science Foundation Antarctic Artists and Writers Program.*



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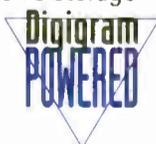
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station on the air. Dalet5.1 goes one step further with Netback2, a powerful utility that complements hardware redundancy (RAID arrays or mirrored servers) by backing up logs and sound files onto a secondary workstation. At a moment's notice, that workstation can be activated and broadcasting restored.

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A variety of high quality sound formats designed to provide stations flexibility in managing their sound libraries is supported. Depending on a station's storage and audio needs, audio can be stored and edited in MPEG and/or LINEAR.



## Group Connectivity

Many stations are now part of groups in which operations, production resources, sound files, and schedules must be shared. Stations that are co-located can use a single Dalet system while stations in different sites can easily and cost effectively exchange information and audio over the Internet or Wide Area Network.



## Integrated Editors

Surfer and Mix Editor, tools for editing sound files and creating segues, are now easier to use and offer greater precision through the improved use of visual cues and an enhanced scrubbing tool. Additionally, Surfer has been refined with easier to use drag and drop editing, preset zooms, multi-track locators, and time stamping - all of which make editing a breeze. Because both tools are integrated with Dalet5.1, edits, once saved, are available for immediate broadcast.

## Music Scheduling

Music Scheduler is an optional module that provides primary and alternate schedule recommendations based upon station defined rules, broadcast history, and title attributes. Since Music Scheduler is integrated with Dalet5.1, stations can avoid the importing and exporting hassles often associated with third-party scheduling software.

## On-Air Flexibility

Dalet5.1 offers many options that provide stations flexibility in their on-air operations. A single workstation can be used to record call-ins or interviews in the studio while a program is being played. The on-air staff has greater operational flexibility through the use of an optional control panel and multiple monitors. And, stations can switch between live and automated programming with relative ease.

More broadcasters worldwide choose Dalet than any other system. Among our references: Emmis, Journal, ABC, Radio Unica, Sinclair, Crawford, CNN Radio, BBC (UK), CBC (Canada). Etc.

## Highlights

Linear Audio/Mpeg  
Group Connectivity  
Music Scheduling  
Internet Broadcasting  
Archiving  
Backup and Redundancy  
Integrated Editors  
Broadcast History  
Macros  
Year 2000 compliant



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# Workbench

Radio World, December 22, 1999

## Site Helps Solve MD Problems

John Bisset

Most stations depend on the auto-timing functions of remote control systems to ensure patterns are changed at the proper time.

However, some sites still employ around-the-clock operators, obviating the need for a remote control system. Figure 1 shows a neat way of posting monthly pattern change times for operators, so they don't overlook the event.

The basic message is printed in bold type. The page is then slipped into one of those plastic "page protectors." Using an erasable "dry marker," you can write the month and times on the clear plastic page protector — erased and updated each month.

Curtis Media Chief Engineer Lew Graves has seen to it that operators switch on time by posting these notices around the station. Entering the pattern change as an

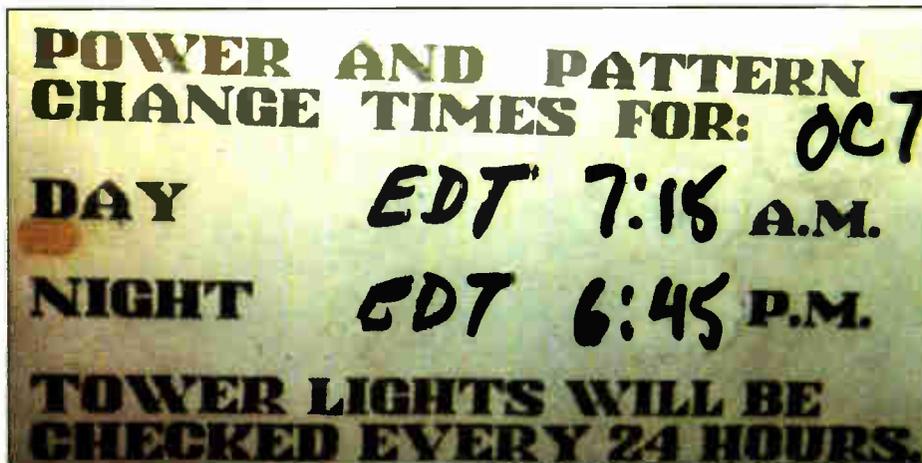


Figure 1: Avoid the fine — provide a reminder for power and pattern change times for your AM.

event on the program log is another idea.

\*\*\*

Clif Glasgow, chief engineer of KSIQ(FM) and KKSC(AM) in Brawley, Calif., writes that he was an early proponent of the Sony MiniDisc to replace cassette and reel-to-reel machines in air studios. Later, they were used to archive spots for the sales department, and to do simple production.

\*\*\*

While on the topic of reminders:

WFDD-FM in Winston-Salem, N.C., set a spiral-bound calendar outside each production room. Production room time is blocked out or reserved using the calendar. With many locally-produced programs originating from the campus of Wake Forest University, the calendar helps everyone plan their time more efficiently.

There's another bonus. CE Alan Roaz can block out engineering tech time for maintenance, so talent and engineering respect each other's schedules. With the first of the year just days away, planning calendars like the one shown in Figure 2 are readily available. Pick up a few for your production rooms, along with the plastic trays. Drill a hole in the plastic tray to tie a pen or pencil and you're in business.

Once again, you, the engineer, have demonstrated to management that you are thinking of ways to save money, to make the whole production system more efficient.

No longer will you have to sneak into production to get work done; block out the time. If you implement the planner, but find it doesn't get used, set the example and block out your maintenance time. The next time you're in the production room and someone wants the room, refer them to the date planner book. They'll get the idea eventually.

■■■

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or via e-mail to jbisset@harris.com

# TCI

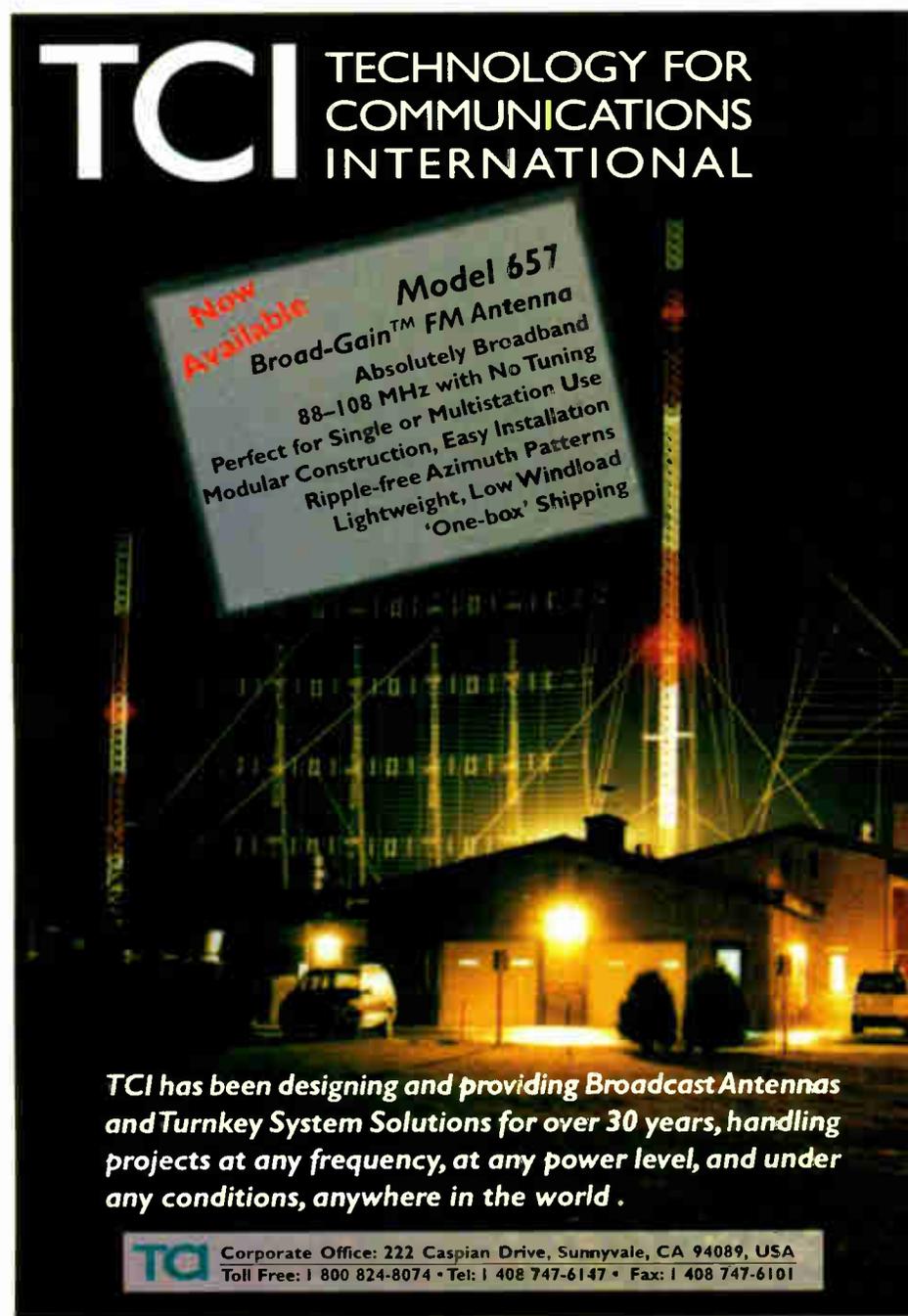
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Figure 2: Organize production traffic using a 'reservation' log book.

Once the jocks got used to them, they were the choice for quick editing of phone bits on the fly using the track split, erase and merge functions. All was well until the machines came up on their one-year anniversary (and the end of the warranty). The problems began with the players insisting that blank disks, even new ones, were "write protected."

Not a big deal, as Clif was using consumer units with prices under \$300. Even if they had to be replaced every year, they were replacing \$2,300 open-reel machines, razor blades and splicing tape. Besides, they were much faster and cleaner to edit.

As for the "write protected" problem, Clif always suspected a sensor problem.

# More Truth in Advertising



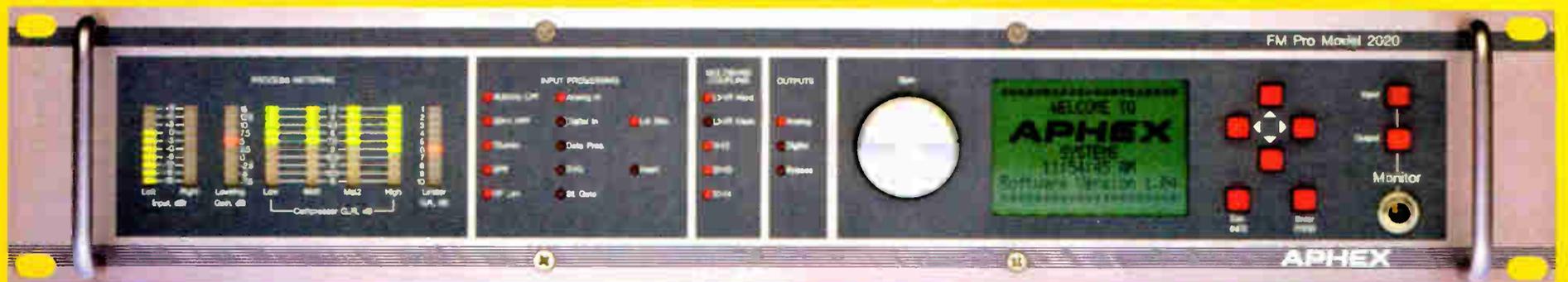
It's no longer a secret, people all over the world are discovering, despite the hype, that digital dynamics processing can't compete with good analog. Even Cutting Edge® claims their Omnia unit sounds almost as good as analog, while both Cutting Edge and Orban® claim each others digital product trashes the signal.

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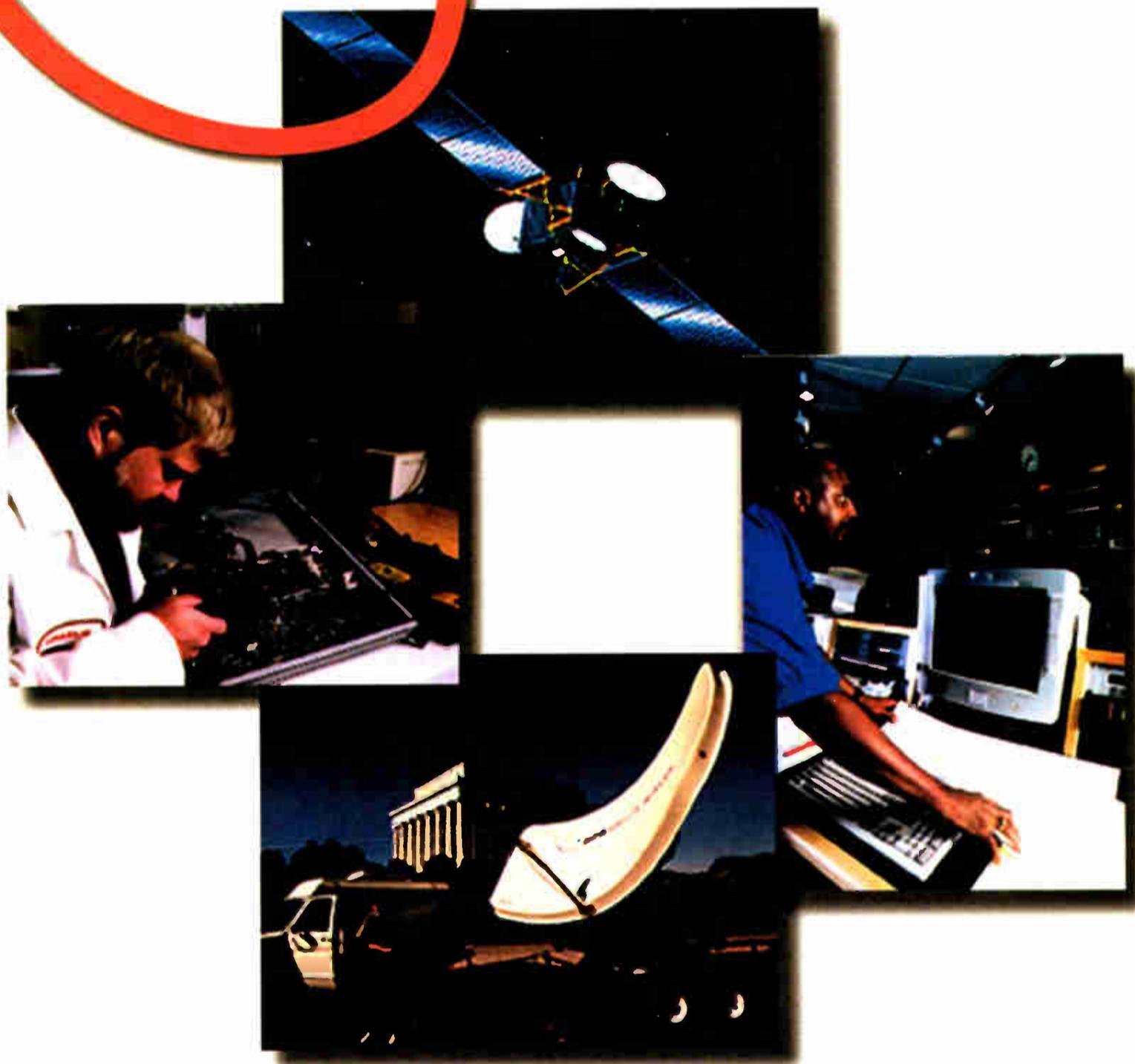
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**PROMO POWER**

## You Have E-Power in Your Station

Mark Lapidus

I don't care if your Web site is getting 200,000 page views and 3 million hits a week. When it comes to the Web, there is still only one killer app. You likely use it dozens of times daily and think it so ordinary, you don't focus attention to it. Yes! You've guessed — it's e-mail.

So simple, yet powerful, able to do what any good marketing or program director wants it to do: deliver a convincing message to get a potential audience to either listen or help generate revenue through attendance at station-sponsored events.

While marketing directors are consumed with constructing and then maintaining Web sites, the main killer app is often overlooked, or abused by incorrect usage.

Why is e-mail so much more important than other Web applications? Because it is universally used and you have much more control over it.

You know who gets your message. After more than one occasion, you also learn who wants to continue to receive your message. You are able to determine when it is sent. You can target very specific users. You completely and easily control the content.

You can use it to drive listening and to move traffic to other portions of your Web site. And e-mail is inexpensive.

**E-mail don'ts**

Radio stations that use e-mail to market themselves make many mistakes. We're all in such a mad rush to make things happen, we sometimes neglect thinking out the consequences of our actions.

The most common error I see is that stations assume everyone cares about what they do or wants to hear what they have to say. This is ridiculous.

Unless you're offering interesting, useful content in your e-mail, you are sending junk. It is simply not enough to construct an e-mail containing only radio station appearance information and

See PROMO, page 27 ►

## Smart Stations Use E-Mail Muscle

Joe Dysart

When leveraged artfully, an ethical e-mail marketing strategy can run circles around the most stunning Web sites. As Mark Lapidus discusses in *Promo Power* at left, a number of radio industry businesses have quietly discovered this powerful fact.

While the promise of the Web understandably has mesmerized the global marketplace, in the late 1990s Internet research marketing firms know that e-mail is the Internet's "killer application."

Consider that more than 75 percent of the 41.5 million adults online use e-mail, according to a Cyber Dialogue/Find SVP survey. One hundred eight million people are expected to be using e-mail by 2000, according to the Electronic Messaging Association.

Ninety-five percent of all Internet users have an e-mail address, according to Ann Handley, editor and chief of ClickZ Network, an e-commerce resource and analysis site. And in the United States alone last year, 2.6 trillion e-mails were sent, according to Handley.

Given the staggering implication of these figures, it's no wonder scores of Fortune 500 companies and others have

integrated the e-mail medium into the core of their online marketing strategies.

Specifically, these online marketers are using e-mail in a various ways, a combination of old forms and new hooks that are possible only through the Internet.

**E-mail newsletters**

Once the purview of the academics and netizens who pioneered the Internet in the late '80s, e-mail newsletters are now the darling of businesses and cor-

porations seeking to establish ongoing relationships with customers and potential customers.

A number of Internet newsletter creation and maintenance software packages — also known as "mailing lists" —

are available. Products include GroupMaster, MessageMedia, Listserv Classic, Liststar and Lyris. (See sidebar for contact information.)

WNWV(FM), "The Wave," based in Cleveland, for example, offers an e-mail-delivered newsletter for breaking news on local artist and music happenings.

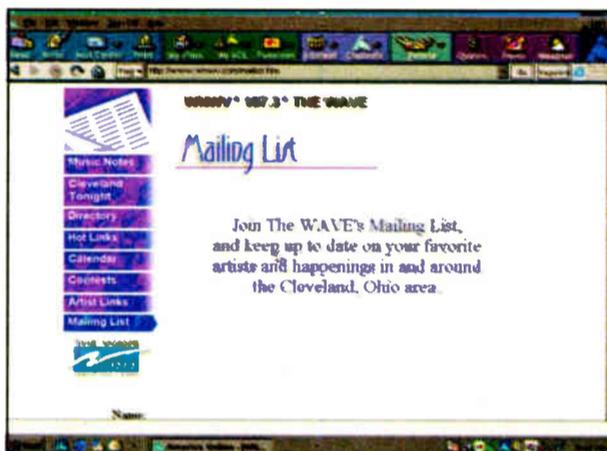
KMTT(FM), "The Mountain," in the Seattle area offers a newsletter sporting insider information on station contests, upcoming local concerts, station-sponsored performances, special offers and the like. WLNZ(FM), a community college radio station in Lansing, Mich., offers a similar newsletter.

**Hot links**

*E-mail newsletters with hot links:* A kind of "next-generation" e-mail publication, newsletters with hot links enable subscribers to "click back" for more information and graphics on specials, new product announcements and the like. Essentially, these links transform an e-mail newsletter into a mobile Web page for a company. Most e-mail newsletter software offer a hot-links option.

*E-mail alert services:* After signing up for these services at company Web sites, subscribers receive special e-mail alerts when the company generates news of special interest. WBAA-FM, Purdue Radio, based in West Lafayette, Ind., regularly sends out e-mail alerts

See E-MAIL, page 28 ►



WNWV 'The Wave' uses a newsletter to help enhance its exposure on the Web.

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MANAGEMENT CORNER

# Radio Marketing's New Boundaries

Vincent M. Ditingo

Buoyed by a strong media economy, the advertising news for radio has been good all year, with inventory tight and revenues soaring. One only has to look at the monthly reports from the Radio Advertising Bureau that throughout 1999 have been headlined "Radio Continues to

one of its best revenue months ever in August." Ad revenue was up 16 percent compared to August 1998, and September radio sales continued the trend, with a 14-percent climb over the same month last year.

For the record, that was the 85th consecutive month of increased radio ad revenue.

However, most savvy radio executives know this is not the time to rest on lau-

driven in the top markets, are looking beyond traditional spot and cost-per-point selling for growing dollars.

Indeed, to help establish their companies as major players in the next century, group owners are beginning to actively cultivate two "non-traditional" revenue sources for expanding income: outdoor and, to a far greater extent, the burgeoning Internet advertising field.

By packaging a radio buy with one of these media, the potential exists for incrementally increasing a station's bottom line. Separately, outdoor and the Internet, in addition to newspapers and television, are now competing for the same local ad dollars as radio.

In recent months, of all established media, radio appears to be taking the most aggressive posture for tapping into the Internet advertising boom. New and existing advertisers are turning to the Internet to extend their brand identities. And because an increasing number of radio station owners are doing the same, through the creation of their

own Web sites, the Internet and radio are fast emerging as the common means for broadening the reach of an advertiser's message.

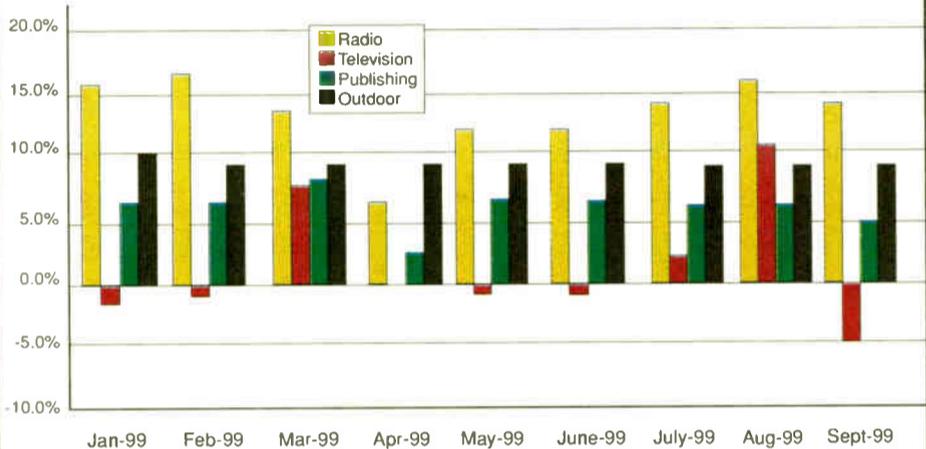
This same cross-media marketing strategy is also true for outdoor billboard boards. In fact, many in the Wall Street community now categorize the highly mobile radio industry and the outdoor advertising industry under the umbrella term of "out-of-home media."

Historically, the advertising synergy between radio and outdoor has always existed. But with changing societal lifestyles, two large radio conglomerates, CBS/Infinity and Clear Channel Communications, have taken this relationship a step further in the 1990s by securing a large segment of the outdoor billboard industry. In effect, these companies collectively control not only a large portion of radio inventory in many major markets, but outdoor as well.

Although there are local advertisers who prefer to spend their ad budgets only with radio or in combination with newspapers, there is no denying that a local morning-drive radio/outdoor campaign, the latter covering heavily traveled routes, would reach many listeners

See DITINGO, page 30 ▶

## Radio Sets the Pace



Radio and outdoor continue to outperform other media, according to Prudential Securities. Figures are changes in ad revenue by month, compared to a year earlier.

Post Double-Digit Revenue Growth."

For instance, in late summer, the RAB declared, "The radio industry experienced

rel's, especially as other marketing options for media buyers expand. Station managers, even those who are duopoly

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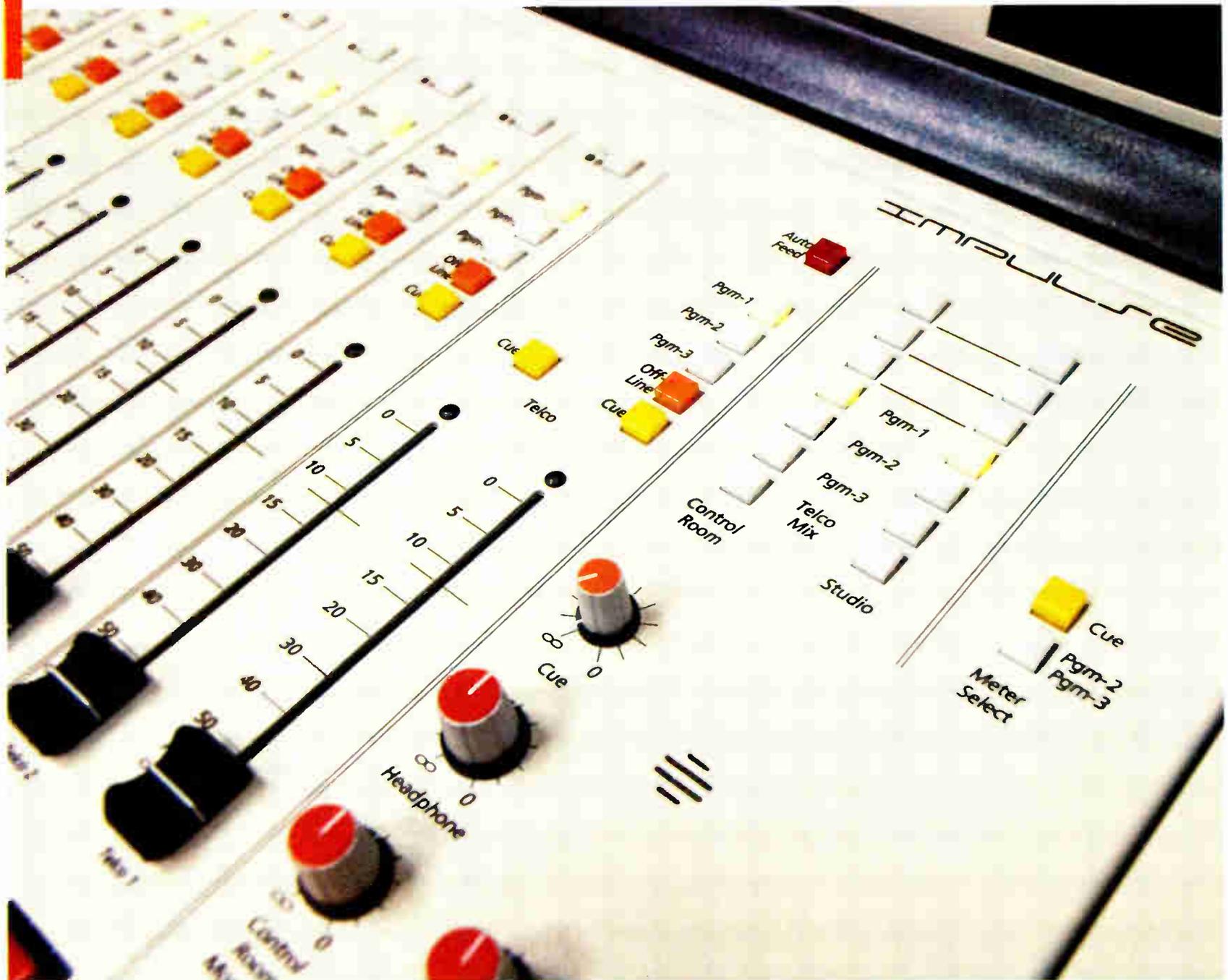
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# How to Tap the E-Mail Advantage

► **PROMO**, continued from page 23  
expect people to care about receiving it. It's like getting a flyer in your mailbox at home about a carpet sale up the street.

Whether it is sent by the post office or by a computer, people hate junk mail. Try to put yourself in the consumer's shoes every time you send e-mail.

## Connecting with listeners

On the other hand, if you offer credible, entertaining news about the stars of your format, you have a shot at making a connection. If you're a talk, news or sports station, you have stars! (Although most of them don't play an instrument or sing well.)

Think of your e-mail as a mini-magazine or newsletter. Select the five top artists in your format and make sure you've got content about at least two of them in every e-mail you send.

As with any publication, make sure your content is well-written and concise, with proper grammar and spelling. It's amazing how much material is sent without being properly edited or proofed.

So if it's all about content, how does your station benefit? Again, think maga-

telling them you'll contact them soon is better than nothing.

Should your e-mail be constructed as text or HTML? When in doubt, go with text. It may be plain, but at least everyone can open it.

In the section on your Web site where visitors sign up for your e-mail newsletter, create a box where the recipient can check "text" or "HTML."

There are companies who are able to tell by your user's e-mails what they are capable of receiving. If you've got the bucks to hire such a provider, it's well worth it. E-mails constructed with HTML and graphics sure are a lot more exciting.

What about e-mails solely for contests or promotion of listening? This depends on what you want to accomplish. You may get away with sending these once in awhile and generating results, but continual bombardment is bound to get you responses from folks who hate junk mail.

## Lists

Although many of my marketing brethren will think this heresy, I'm not a big fan of buying e-mail lists.

Even when you hit true potential listeners, you run the risk of being viewed as an intruder into the cyberspace they pay for monthly. It's easy enough (but

time-consuming) to develop lists yourself. If you don't know how, just cruise a few big station Web sites and look for the many ways in which addresses are captured.

Finally, don't accept an "unsubscribe" without at least writing your complainant back and asking them why don't like getting e-mail they initially signed up to receive. They're happy to tell you truth!

I'd like to see your station e-mail. Send it to [marklapidus@yahoo.com](mailto:marklapidus@yahoo.com)

If you're a regular reader, you know this isn't my everyday address. Hey, I'm no dummy — I hate junk mail!

■ ■ ■

*Mark Lapidus is president of Lapidus Media, and works in programming, public relations and marketing consultation.*

**Stations assume everyone cares about what they do or say. That's ridiculous!**

zine. I never said you couldn't promote your station. You simply have to be smart about packaging. Either as part of your content or after it, pick a few station items you wish to plug.

Caution: Don't overdo it. The reader will not remember more than a few things, and over-commercial exploitation has the potential to get you an "unsubscribe" e-mail back from users. Make sure you offer one or two specific reasons to listen to your radio station.

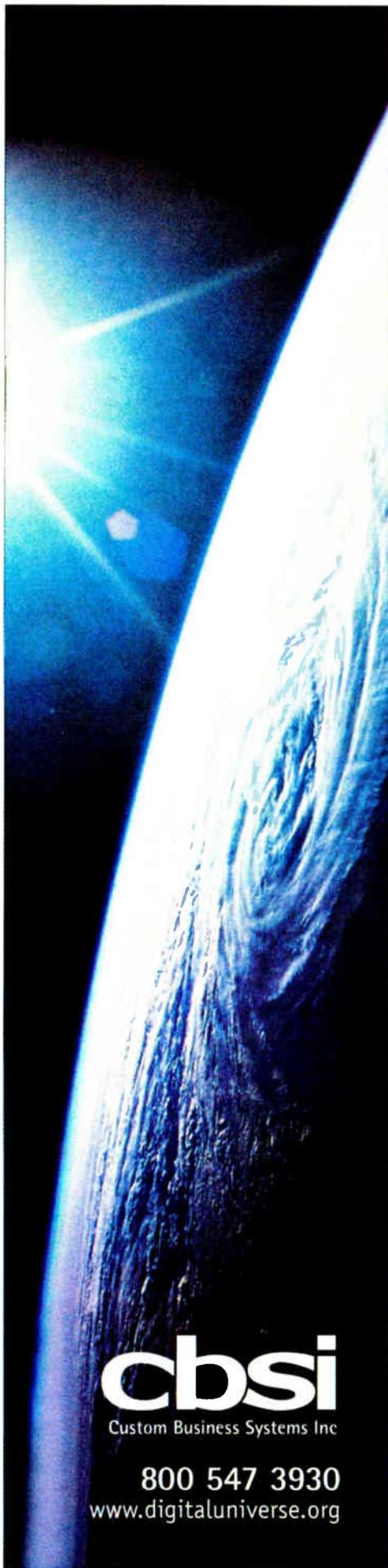
Perhaps one of them is a contest and the other is a timely feature or program. Your content may also permit you to plug in a few links which when clicked will open your user's browser and take them to your site.

## Engage

E-mail is meant to be interactive, but it won't be if you don't make it so.

Along with the links above, try engaging your user with at least one question. This gets them involved with you and increases your chances of making an impression. Maybe you'd like to ask them to vote on something and then listen tomorrow for the results of that vote.

Interactivity also means you must respond to all inquires. If you're not willing to take the time, you've entered the wrong arena. Even an auto-response thanking people for their e-mail and



**"We're running Digital Universe in the studios 24 hours a day, and loving it!"**

—David Brown at KALS Radio

KALS Radio needed to do more at their station without adding people. So they had some demanding criteria for their new live assist system. It had to be easy to use and maintain. Flexible enough to handle multiple program sources. And not something that would trash their audio quality with heavy compression.

David Brown, Program Director, selected Digital Universe.

**"Digital Universe has made us more productive while reducing the strain on my budget."**

Announcers now record their shifts in advance, using Dynamic Voice Tracking to keep KALS sounding live. NetCapture records their satellite programming right into the system. And running linear audio has given them a quantum leap in quality.



**"Network Capture is flawlessly recording our satellite programs, and we sound noticeably better on the air."**

Its intuitive design makes Digital Universe easy to learn and a breeze to operate. But when KALS has questions, they need answers fast.

**"We are very pleased with your customer service. You guys are always there when we have a question, and are pleasant to work with no matter how trivial our questions."**

Easy to use, flexible to work with, and designed for the long haul — what can CBSI's Digital Universe do for your station? Call us today to find out more about how broadcasters worldwide are stepping into the future with Digital Universe.

# Reach Listeners With E-mail Plus

► E-MAIL, continued from page 23 featuring program listing updates and local breaking news.

**Interactive e-mail newsletters:** Corporations looking to generate an ongoing dialogue often sponsor interactive e-mail newsletters to which every subscriber can add content. Such newsletters are perfect for developing new product ideas, new brand images and the like. (All titles from the newsletter vendors above offer a subscriber interactivity option.)

**Participation in third-party e-mail newsletters:** The mailing list clearinghouse Liszt tracks more than 90,000 special-interest "mailing lists" or newsletters circulating the Net. Many corporations regularly add content to these newsletters to keep their brand names in front of readers with highly specific — and highly targetable — interests. Liszt tracks 351 mailing lists focusing on music. More than 14 mailing lists target rock music alone.

Once you've experimented with e-mail marketing basics, you may want to move

and receive an "instant" e-mail back on a subject area of highly specialized interest. Essentially, this is target marketing in its most precise implementation. Type "auto responders" into any search engine for more information.

**E-mail product pix-to-go:** Now that sending pictures over the Net is a snap even on "beginner" services like America Online, it's no wonder companies are capitalizing on this facet of the technology to better represent their services and products via e-mail. All that's needed to send product pix is any popular e-mail program.

**E-mail slideshows-to-go:** Take another look at the latest incarnation of programs like Microsoft PowerPoint and Corel WordPerfect Office 2000. You'll find beefed-up applications that enable a company to create and send a slideshow via the Net easily. Another easy-to-use program: Catch-The-Web by Math Strategies.

**E-mail animations to go:** Firms more at home creating and sending product animations via e-mail have a slew of tools they can use. Software titles in this category — in addition to titles in the slideshow's category above — include Hijaak Pro by IMSI software, PrintShop ProPublisher 2000 by Broderbund and Barking Cards by Blaze Technologies.

**E-mail panoramic virtual reality to go:** One of the most sophisticated graphic presentations that can be sent via e-mail, panoramic VR enables firms to create 360-degree virtual "walk-throughs" of products and facilities.



KMTT also uses a newsletter to attract traffic to its Web site.

**Some 108 million people are expected to be using e-mail by the year 2000.**

Other interactive e-mail newsletters are not sponsored by a particular corporation, but are nonetheless a good vehicle for radio stations to generate enhanced exposure on the Internet. The interactive e-mail newsletter "CLASSICA" for example, targets classical music lovers.

on to even more sophisticated uses of the medium. Most popular techniques among these include:

**E-mail auto responders:** Popular with firms savvy in e-mail marketing, auto responders enable Net surfers to send a simple e-mail to a pre-designated address

Apple QuickTime VR pioneered the medium. Other panoramic VR toolmakers include Communique and Infinite Pictures.

One caveat: None of this e-mail marketing technology will do any firm any good if the resulting presentation is sent as "spam," or unsolicited e-mail. Virtually anyone who has been on the Net more than 24 hours knows that spammers are the scourge of the Net, and that spamming is the quickest path to commercial suicide known today.

Simply stated, it's not worth it.

Joe Dysart is an Internet business consultant based in Thousand Oaks, Calif.

Reach him via telephone at (805) 379-3841, or e-mail at joedysart@aol.com

## Radio's Most Wanted

**PROFILE: John Caracciolo**  
 Vice President, General Manager  
 WLIR / WDRE / WXXP Long Island,  
 Jarad Broadcasting, Garden City, N.Y.  
 Radio World reader for 14 years



**Hometown:** East Northport, N.Y.  
**School:** NY Institute of Technology (Bachelor's Degree)  
**Favorite color:** Black  
**Coffee:** Milk and sugar  
**Favorite radio format:** Modern Rock  
**Favorite section in Radio World:** GM Journal  
**Favorite piece of equipment:** My new Harris Platinum Z transmitter  
**Best thing about your job:** Getting paid to do my hobby  
**Hobbies (other than radio):** Reading, keeping up with my four-year-old daughter Noelle  
**Proudest moment:** Rebuilding WLIR as the chief engineer, then taking over as GM and rebuilding the business to the best year in its history  
**Reads Radio World because:** It is the most comprehensive radio publication on the market today

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**From:** Radio World      **CC:**

**To:** Marketing Manager      **BC:**

**Subject:** Here's Help to Power Your E-Mail

**Message:**

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 The Electronic Messaging ([www.ema.org](http://www.ema.org))  
 ClickZ Network ([www.clickz.com](http://www.clickz.com))

**E-mail newsletter vendors:**  
 GroupMaster from MessageMedia ([www.messagemedia.com](http://www.messagemedia.com))  
 Listserv Classic from L-Soft International ([www.lsoft.com](http://www.lsoft.com))  
 Liststar from Starnine ([www.starnine.com](http://www.starnine.com))  
 Lyris from Shelby group ([www.lyris.com](http://www.lyris.com))

**Check these sites for stations with newsletters:**  
 WNWV(FM), "The Wave" ([www.wnwv.com](http://www.wnwv.com))  
 KMTT(FM), "The Mountain" ([www.kmtt.com](http://www.kmtt.com))  
 WLNZ(FM) ([www.lansing.cc.mi.us/sas/wlnz](http://www.lansing.cc.mi.us/sas/wlnz))

**Interactive e-mail newsletters**  
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 Catch-The-Web by Math Strategies ([www.catchtheweb.com](http://www.catchtheweb.com))

**Panoramic VR**  
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 Barking Cards by Blaze Technologies ([www.barkingcard.com](http://www.barkingcard.com))  
 Quicktime VR ([www.apple.com](http://www.apple.com))  
 Communique ([www.cvcmedia.com](http://www.cvcmedia.com))  
 Infinite Pictures ([www.smoothmove.com](http://www.smoothmove.com))  
 "The Mountain" based in Seattle ([www.kmtt.com](http://www.kmtt.com))

# Delivering Voices Via E-Mail

## James Careless

East Coast Radio may be located in Ireland, but its voice-over recordings arrive almost instantly from Phoenix, Ariz.

Back in 1994, East Coast Radio — an FM station in Bray, County Wicklow, Ireland — was looking for a distinctive announcer to voice its station identification and other tag lines. In particular, they wanted someone who would stand out from the usual crop of Irish voices.

That is why East Coast Radio selected Steve Wood, an announcer with "great depth in his voice," said Production Manager David Dennehy. A seasoned announcer with credits at many major U.S. stations, Wood runs Steve Wood Voice Works LLC out of his home in Phoenix.

## Never a problem

Despite being halfway around the world, distance has never been a problem for the collaboration between Wood and East Coast Radio.

The station simply sends Wood the script by e-mail. Then, when it is time to record, a station producer listens in over the telephone while Wood records his takes.

Initially, the approved takes were sent from Phoenix to Ireland via Federal Express or a similar courier service. Of course, this meant a three-day wait for the tape, as well as hefty international courier charges.

East Coast Radio was willing to live with the courier charges. However, they

eventually ran into a situation where a three-day wait was three days too long.

The problem was the voice-over on a weather report, said Dennehy. One day "the sponsor changed very rapidly, (and) we needed to get the spot changed very rapidly."

Fortunately for East Coast Radio, Steve Wood was experienced in shipping audio via the Internet.

He sent his first voiceover via the Internet just before Christmas 1996. At the time Wood had recorded some narration for a major sales event, and the tape had to be there on Saturday.

Unfortunately, "I did not mark 'Saturday delivery' on the FedEx package," said Wood. "So late Saturday afternoon the client called me, frantic because the TV commercial had to be edited; it was scheduled to air on Monday morning (and) there was no audio."

With the station facing a \$90,000 loss if the spot did not air at the right time, Wood did what anyone in his position would do.

First, "I panicked," he said. Then "I went into the studio and started looking at the Internet thinking 'there has got to be a way to send 30 seconds of voice-quality audio via the Internet like you would any other kind of file!'"

With time ticking away, Wood searched the Web until he found a \$20 shareware recorder program. Using this, he recorded his audio as a .WAV file and then e-mailed it to himself.

It worked, so Wood then sent the

voiceover via e-mail to his now-desperate client. It got there; "I saved the day, and I opened up a whole new world for myself."

As for the crisis at East Coast Radio? There is an eight-hour time difference between Arizona and Ireland, so it was good luck that Wood got the message in time. The East Coast Radio e-mail arrived at midnight Phoenix time, just one hour before the revised voice-over was needed.

Luckily Wood was online when the message was sent. In a flash, he recorded the new voice-over track and e-mailed it to East Coast Radio Chief Executive Seán Ashmore.

The result: "In a matter of three or four minutes, Ashmore had it playing in his studio," said Wood, "which is incredible."

## Big question

The big question, of course, is how do you e-mail a broadcast-quality signal to someone without crashing their e-mail system?

After all, a 60-second .WAV audio file consumes about 10 MB of data, which is more than many e-mail programs can easily handle and more than some ISPs will accept.

The answer, said Steve Wood, is ISO/MPEG Layer II compression. With compression, a 60-second .WAV file can "be reduced 90 percent to about 1 MB" without sacrificing noticeable quality.

Wood uses an Orban Audicity digital

audio editing system and a ProTools-equipped Macintosh G3 to do all his production.

"I do my recording and editing with the Orban, and then, once I have the piece the way I want it, I record it into ProTools," he said. He then selects the item, encodes it with an ISO/MPEG Layer II compression plug-in from QDesign.

The resulting file is attached to an e-mail and sent to the client, in this case East Coast Radio.

At the receiving end, East Coast Radio downloads the compressed file and converts it to .WAV format. It is prepared for air using Cool Edit Pro software and stored on the station server for later production and/or broadcast.

But do these compressed voiceovers actually sound good? Yes, said David Dennehy. "The quality is bang on."

This said, not everyone can pull ISO/MPEG Layer II audio off the Web and make it sound great on air. The critical element is the soundcard. You have to spend several hundred dollars for a professional-quality soundcard, said Wood, to ensure that the computer can replay the file properly.

With good soundcards in the production and playback computers, the sky is the limit.

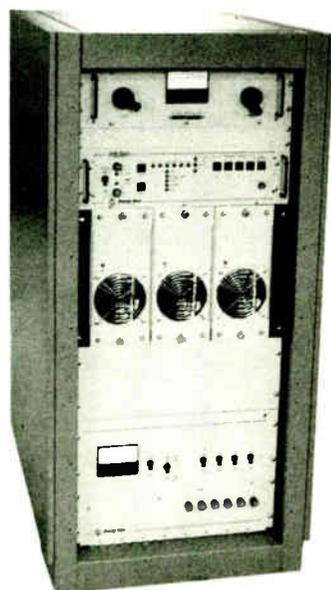
In fact, with e-mail and ISO/MPEG Layer II compression, broadcasters can now tap fresh voices from around the world. It is no small wonder that East Coast Radio wants to organize a national "voice bank" in Ireland, so that the same local announcers do not get used over and over again.

■ ■ ■

The Steve Wood Voice Works LLC Web site is located at [www.stevewood.com/](http://www.stevewood.com/)

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# Net No Fluke in Radio's Rebirth

► DITINGO, continued from page 24 commuting to work.

According to a report from the Wall Street investment firm Prudential Securities, on an individual basis, radio and outdoor outperformed television and print from January through July 1999, and then again, in September.

## Revenue growth

Typically, radio has been posting roughly 10-percent to 15-percent revenue increases and outdoor 7-percent to 10-percent growth, while television and publishing each have been registering growth rates of some 6 percent or lower.

## Many on Wall Street now categorize radio and outdoor under the umbrella term 'out-of-home media.'

Findings are based upon year-to-year ad revenue percentage changes.

With some exceptions, however, this new relationship between radio and outdoor and the subsequent growth of outdoor as a major advertising medium is tempered by the fact that outdoor media opportunities can be limiting for some smaller-market radio operators who may not be part of the outdoor conglomerate landscape.

Conversely, the Internet provides radio with a wide-open playing field to garner additional sales revenues.

Spurred by the growth of Internet use by consumers and radio's growing involvement in online sales, transactional day-to-day radio selling is, in fact, becoming multidimensional.

For today's radio sales force, there are new terms to understand, such as banner advertising; new negotiating and pricing

skills to conquer and new seller-buyer relationships to be cultivated.

To that end, station sales managers are either training sellers in Web site marketing for their own sites or designating specific account executives to handle the task exclusively. The ultimate goal here is to create a one-stop shopping environment for consumers.

This trend is reflected in the Radio Advertising Bureau's new series of regional workshops, titled: "What Every Radio Sales Professional Must Know About The Internet." The first workshops, which launched in September, have been well-received in several cities. They are

scheduled to run at least through a Nov. 15 stop in Denver, and the RAB is considering expanding the series to visit additional markets.

"We are addressing how radio stations can best sell the real estate on their Web sites," said Dave Casper, RAB senior vice president of services. According to Casper, the workshops "examine Internet content elements including site design, Webcasting, cross-promotion and contesting while delivering essential information on revenue options like banner ads, click-throughs, e-commerce, e-classifieds and Web reps."

At the same time, more stations are streamlining their programming online. Radio is now "perfectly positioned" to deliver content over the Internet, said Casper, adding that the Internet offers radio operators services like classified ads, local community information and

online coupons.

Underscoring the importance of the Internet advertising factor to radio's continuing growth, RAB is unveiling a new, e-commerce turnkey program that will assist station members in putting their local retail clients on the Internet.

In essence, the move will create local electronic shopping malls for a station's Web site with links to each client's site.

"Radio managers should view the Internet as another means of distribution. It is not a threat," said radio programming and sales consultant Ed Shane.

The Internet gives radio even greater competitive leverage, said radio sales trainer Paul Anovick, president of Media Training Systems, which is affiliated with Interep. "There is excellent synergy as stations can easily create traffic for the Net."

Anovick works closely with First Internet Media Corp., based in San Clemente, Calif. The company specializes in on-site selling for radio by installing e-commerce systems as well as training sales personnel on a variety of Internet selling opportunities.

Expanding into either outdoor or Internet advertising or both allows radio operators to set a solid business foundation for the coming years. But it starts with aggressively training all radio sales professionals to be "the" expert in solving marketing dilemmas.

As Paul Anovick observes, the burning issue in radio sales remains finding, motivating and keeping good people, especially as local station clusters grow.

■ ■ ■

Vincent M. Ditingo writes frequently on radio management, marketing and information technology issues.

Contact him via e-mail at [vditingo@aol.com](mailto:vditingo@aol.com)

### 'Murrow Boys' on 'Roundup'



Robert Trout, Dan Rather and "Murrow Boy" Richard C. Hottelet gather near a photograph of the late, great Edward R. Murrow at "Black Rock," CBS headquarters in New York City in November.

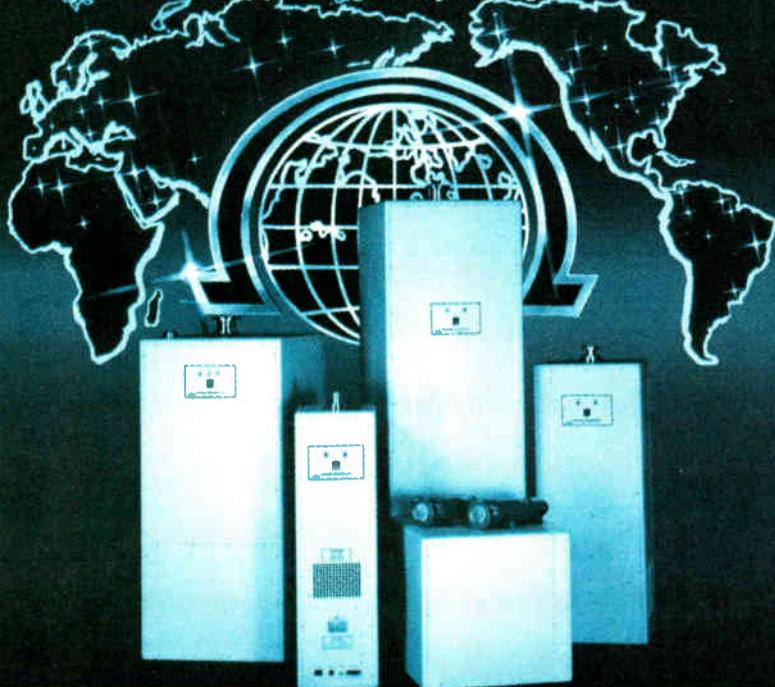
CBS Radio News reunited the surviving "Murrow Boys" with current and former CBS News correspondents for a three-hour radio special that will air in segments through Jan. 5, 2000.

The "Murrow Boys" were radio correspondents recruited by Murrow to cover World War II for CBS News. All of the surviving members of the group are participating in the special. They are Larry LeSueur, Howard K. Smith, Richard C. Hottelet and Mary Breckenridge Patterson.

Hosted by Dan Rather, the "CBS News 20th Century Roundup" will feature roundtable discussions and segments about the great events of the 20th century. Joining the reunited "Murrow Boys" will be Charles Osgood, Andy Rooney, Lesley Stahl, Marvin Kalb, Bob Schieffer, Bill Plante, Christopher Glenn, George Herman, Robert Trout, Daniel Schorr, Ed Bliss and Norman Corwin.

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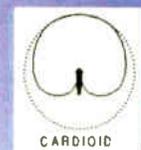
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PRODUCT EVALUATION

## A-T Mic Borrows From Past

Ty Ford

For a mic to stand out in the overcrowded condenser market, it needs attitude.

The AT4047/SV FET cardioid condenser microphone is a departure from the neutral A-T sound. It has attitude — and a suggested retail price of \$695, including the mic, the vinyl case and suspension mount.



AT 4047/SV FET

The sound comes from a combination of new, quieter electronics — a self-noise of 9 dB-A with an output of 17.7 mV +/- 2dB @ 1Pa and a new output transformer.

Audio-Technica Engineering Supervisor Bob Green said, "We were out to get the old characteristic of an early transformer output coupled condenser mic, but with better circuitry and elements. The transformer is custom wound. The capsule of the AT4047/SV is loosely based on the AT4060, but the diaphragm tension and baffle have been modified."

Green said both mics use dual diaphragm capsules to help control the pattern, even though they are more costly to manufacture than single-sided capsules.

I compared the AT4047/SV to a Neumann TLM 103 through GML mic preamps. The AT4047 has 2 dB more self-noise, but has 3 to 4 dB higher output than the Neumann. When the mics were trimmed for equal level, the self-noise difference

See MIC, page 40

PRODUCT PROFILE

## Pellegrini Is Living the Dream

Ken R.

Building blocks that are found under any successful radio career can include dragging oneself up through small markets, receiving dozens of rejection letters, and taking part-time jobs to make the rent payment.

"For anyone who has ever dreamed of making it into the big time, I can say it's worth it," says John Pellegrini, creative director of ABC Radio station WLS(AM), Chicago.

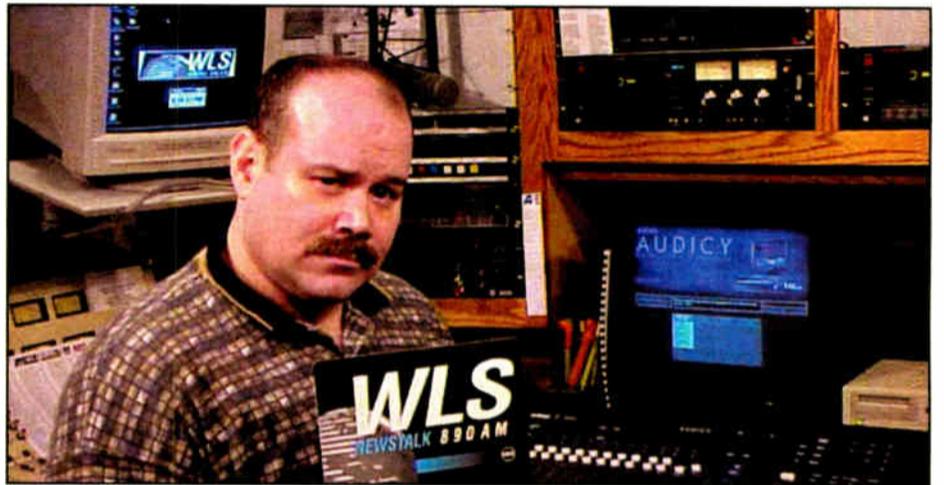
When speaking of "heritage" stations, this is one of the biggest. From the "National Barn Dance" to 1960s personalities such as Dick Biondi and Art Roberts, to the news/talk format of today, WLS has had a monumental influence. Its 50 kW clear-channel signal is heard across the Midwest and many other stations copy its production style.

His title of creative director is usually production director at most stations, which is the role he fulfills. Pellegrini said, "I primarily create commercials, but

ing out on top 40, he tried improvisational comedy in Chicago, where he picked up valuable lessons in writing and setting up scenes.

Stints at several Las Vegas stations got a little closer to his dream of handling production at a major-market station.

See WLS, page 37



John Pellegrini in the Studio

**Equipment and technology are great, but if the writing isn't creative, nothing will help.**

— John Pellegrini

I help with the promos, too.

"My dad was a huge fan of Stan Freberg. My early heroes included Dick Orkin, who created Chicken Man. I was always interested in the writing. What timing those guys had."

Pellegrini's first radio job was in 1978 at WTTN-AM-FM in Watertown, Wis.

"I got in somehow as a nighttime DJ. The station had an 'all-over-the-road' format from polka to country. I was supposed to be playing rock, but I had to bring in my own music.

"Not only was I getting a whopping \$95 a week and spending at least that much on records, I also had to take out the trash every night."

From there Pellegrini headed to WRIG(AM) and WDEZ(FM) in Wausau, Wis., where he found an interest in radio production. "It was alright, but after I only got a 50-cents an hour raise I started sending out tapes."

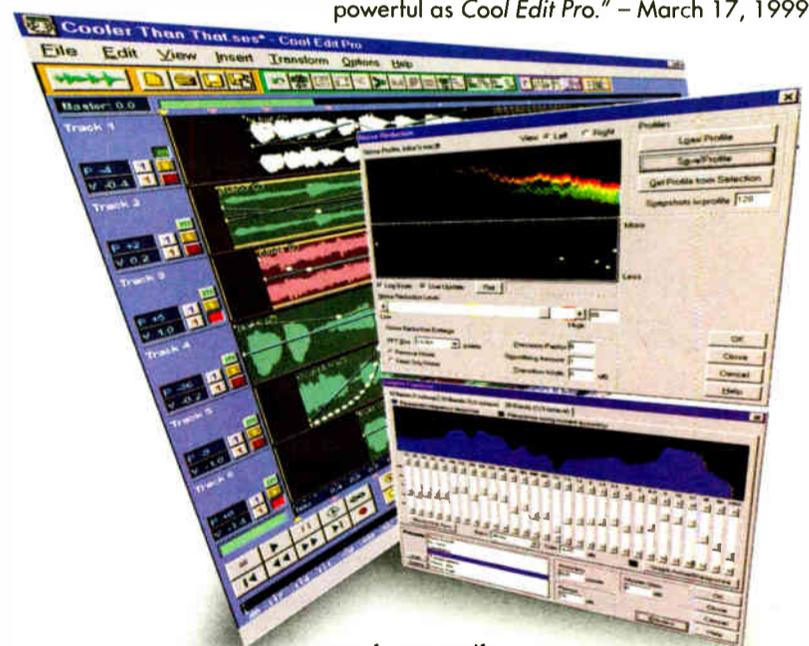
Next stop was WDEK(FM) in DeKalb, Ill., where he worked as the morning man for two years. After burn-



Perhaps you've heard the buzz around Cool Edit Pro, the complete software multitrack recording studio. Why is it so popular?

**It's so easy to use!**

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LINE OUT

# Mic Orientation Can Affect Polarity

**Bruce Bartlett**

Suppose you are broadcasting an interview in which the announcer and interviewee are on opposite sides of the table. Because the mics are aiming in opposite directions, are the signals opposite polarity? Should the polarity be flipped on one of the mics?

*Studio Sessions* Editor Paul Cogan asked, "Does polarity change with the mic's orientation? For example, there are a bunch of cardioid mics pointed at the stage and two cardioids 20 feet away pointed the opposite direction at the audience. Wouldn't those have opposite polarity with the stage mics?"

This turned out to be a challenging question.

## Pickup patterns

Before going into the answer, here is a quick review of microphone polar patterns:

*Omnidirectional:* Picks up equally in all directions, responding only to sound pressure, which is non-directional.

*Bidirectional (figure 8):* Picks up best in two directions, in front of and behind the mic. It has a front lobe and a rear lobe, which are in opposite polarity. It responds to sound velocity, not sound pressure.

*Unidirectional:* Picks up mainly in one direction, in front of the mic.

Three types of uni patterns are cardioid, super-cardioid and hyper-cardioid. The uni patterns are the sum of an omni and bidirectional pattern in various ratios. Super and hyper patterns have a rear lobe in opposite polarity with the front lobe.

## Phase shift

Are the audience mics out-of-phase with the stage mics? Even if the audience mics are aiming the same direction as the stage mics, the audience mics are thousands of degrees out-of-phase with the stage mics because of the sound travel time from stage to audience.

The signal delay from stage mics to audience mics is  $T = D/C$ , where  $T$  is the delay in seconds,  $D$  is the distance between mics in feet and  $C$  is the speed of sound in air — 1,130 feet per second. The sound delay between two mics 20 feet apart is  $20/1130$  or 17.6 milliseconds. The audience mics receive the sound 17.6 msec after the stage mics.

What is the phase shift caused by this delay? Phase shift is  $2\pi FT$ , where  $2\pi$  radians is 360 degrees,  $F$  = frequency and  $T$  = time in seconds. If the frequency is 1 kHz, the phase shift between stage mics and audience mics is  $360 \times 1000 \times 0.0176 = 6,336$  degrees!

What's another 180 degrees of phase shift?

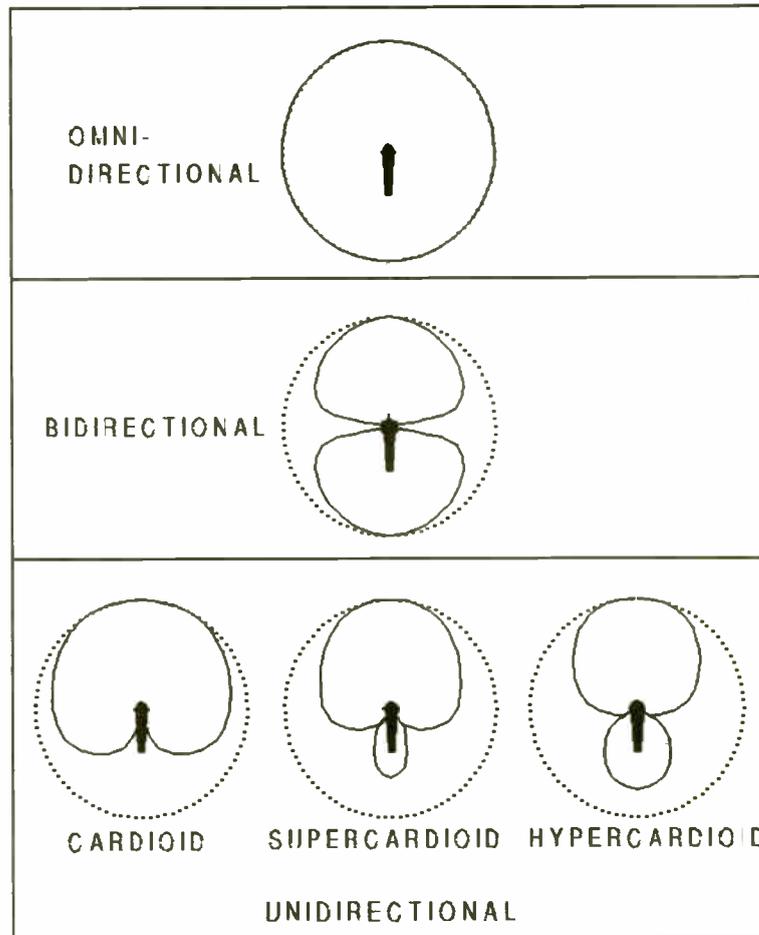
An omni has no polarity reversal based on mic orientation. A sound wave is made of compressions and rarefactions of air molecules. Compressions are regions of higher-than-normal air pressure; rarefactions are regions of lower-than-normal air pressure. If one mic is in

which is a sine wave with amplitude 1 at 0 degrees, amplitude 0 at 90 degrees, and so on.

For a sound arriving on axis,  $A = 0$  degrees. According to the equation, the output of the mic is 1.0, which is positive or in-polarity.

For a sound arriving from the side,  $A = 90$  degrees. Output is 0.5, which is positive or in-polarity.

For a sound arriving nearly from the rear,  $A = 179$  degrees. Output is



Mic Pickup Patterns

a compression the same time another mic is in a rarefaction, they are 180 degrees out of phase.

Imagine you have an omni audience mic aiming at the stage. You also have an omni audience mic aiming away from the stage, coincident with the other mic. The two mics have their diaphragms aligned vertically.

Both mics experience a compression and both diaphragms are pushed inward at the same time because they are at the same point. Therefore, both mics produce a positive voltage and have the same polarity, even though they are aiming in opposite directions. There is no polarity reversal based on mic orientation.

A bidirectional or figure-8 mic is sensitive to the direction of the sound wave. If two bidirectional mics are aiming in opposite directions with the ribbons aligned vertically, the sound wave is moving front-to-back in one mic and back-to-front in the other mic. One mic puts out a negative voltage at the same instant the other mic puts out a positive voltage, putting those two mics in opposite polarity.

## The polar plot thickens

Does a cardioid mic's polarity change when you turn the mic around? A little math will help:

For a cardioid mic, the polar pattern equation is: Output level =  $0.5 + 0.5 \cos A$ , where  $A$  is the angle at which sound approaches the microphone. "Cos" stands for the cosine function,

0.000076, which is positive, which is still in-polarity.

For a sound arriving exactly from the rear,  $A = 180$  degrees. Output is 0, which is non-defined polarity.

The polarity is positive for all angles infinitesimally approaching 180 degrees, so there is no polarity reversal at any orientation of the cardioid mic.

If the polar pattern is bidirectional, the polar equation is: Output level =  $\cos A$ . This mic's output goes negative or opposite polarity when angle  $A$  is between 90 and 180 degrees.

If the polar pattern is hyper-cardioid, the polar equation is: Output level =  $0.25 + 0.75 \cos A$ . This mic's output goes negative or opposite polarity when the angle  $A$  is between 110 degrees and 180 degrees.

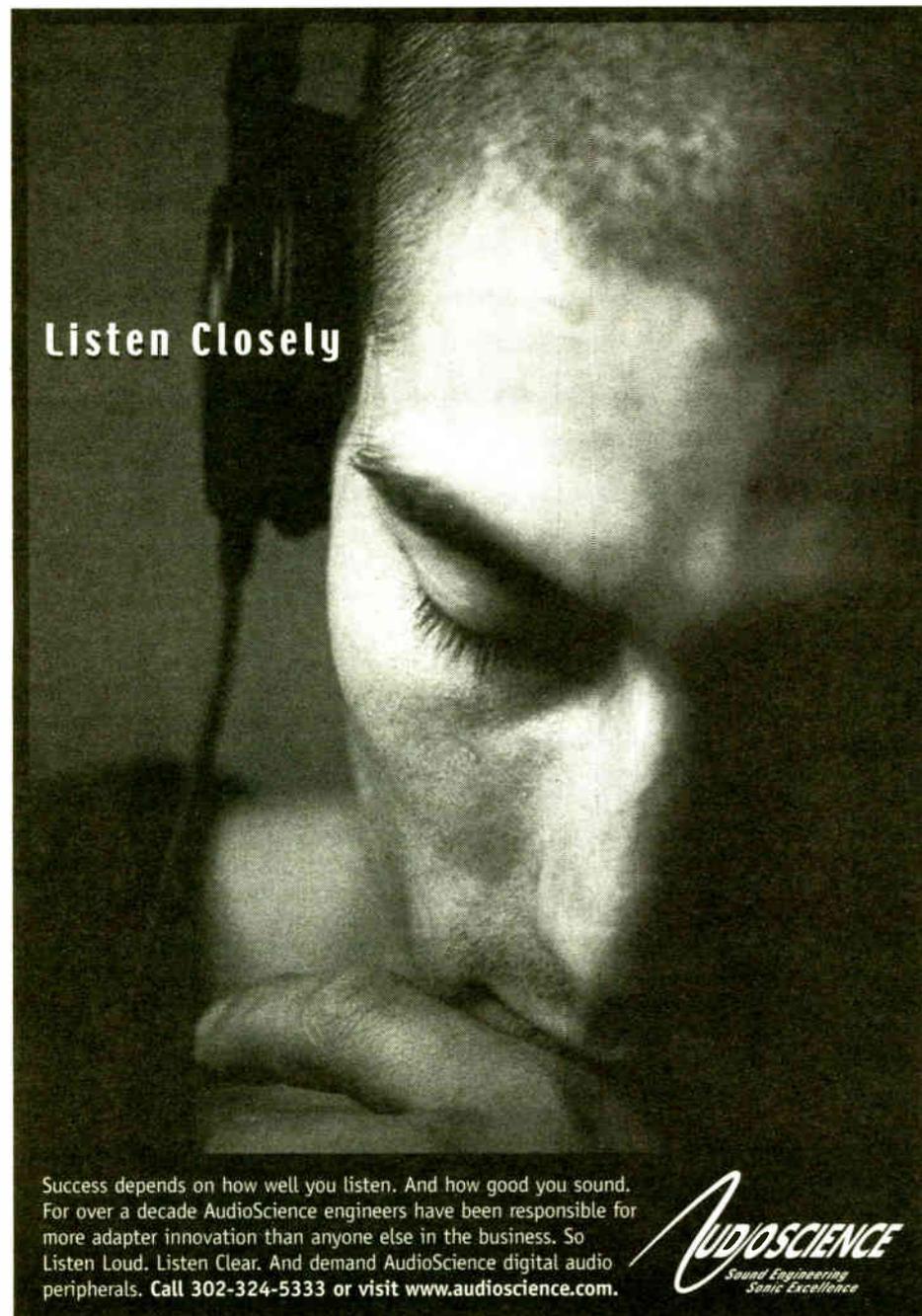
A hyper-cardioid, super-cardioid or bidirectional mic's polarity does change with orientation. An omni or cardioid mic's polarity does not.

So, if you are using cardioid mics for across-table interviews, you do not need to flip the polarity of one mic.

However, the sum of two cardioids back-to-back is an omni pattern. If you flip the polarity of one mic, the sum is a bidirectional pattern, which would partly reject the room acoustics. After all, it might be the best idea to flip polarity.

■■■

Bruce Bartlett is a microphone engineer at Crown and the author of "Practical Recording Techniques 2nd Ed." published by Focal Press.



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PRODUCT EVALUATION

# IQS Software Wins Playing Field

Carl Lindemann

The Innovative Quality Software multitrack and editing package has included a compressor, gate and limiter feature since the first version (6.x) for Windows 95.

The new Levelizer plug-in is a refinement of this standard feature with new, important updates, making it easier to use. The feature reminds me of days gone by, when I had more time to tweak the final mix.

by mastering engineers are now essential for radio.

Most audio production software, SAW included, come with some mastering capabilities. The Levelizer adds to the standard package an improved interface to allow for greater precision in controlling settings.

It uses a gain reduction meter to provide critical information on the impact the processing has on a file. Aside from reverb, the Levelizer handles most of the "meat and potatoes" audio processing

showing set levels in relation to the audio file. Instead of using a virtual slider, the Levelizer has a digital readout that puts the threshold at a precise point between 0 dB and infinity.

The compressor's ratio setting has traded a slider for a digital interface. The graphical representation on the sound file is the same.

The gate adds a control for the noise floor levels, which is a helpful feature missing on the standard version. If there is low-level noise in the studio, such as the noise from hard drives, it can cut this out.



In the days of standalone stations, it was possible to custom-tweak for a station. For radio producers preparing material for broadcast on multiple stations, the Levelizer is key.

With production going to multiple sites, audio must sound right regardless of the idiosyncrasies of any particular setup by using processing tools to master and normalize production. Methods used

radio producers need.

The standard compressor, gate and limiter included in SAW Pro/32/32 Plus is a straightforward affair. The gate and compressor have sliders to change attack, release and threshold levels. The threshold sliders can be dropped and dragged to show the impact on the waveform.

Parallel lines appear above and below

### Good and loud

The peak limiter and normalizer commonly are used for generating the highest possible volume levels without introducing any perceptible distortion.

Both changed from sliders to digital readouts that can be precisely set. Working with sliders can be a time-consuming process, while a digital readout immediately hones in on the exact values.

The Levelizer adds three features, the key buffer and key listen functions and a gain reduction meter.

The key buffer is used to trigger the gate and compressor from the same track that is being processed or from other tracks for ducking. Users can make certain elements jump out in the mix by keying levels on selected tracks. Also, the key buffer with hi/lo EQ can be used as an effective de-esser.

### Product Capsule: The IQS Levelizer and Reverberator

#### Thumbs Up

- ✓ Flexible, precise interface
- ✓ The key buffer/key listen function gives the user control over ducking and de-essing
- ✓ The gain reduction meter makes it impossible to judge the amount of processing
- ✓ Great sound

#### Thumbs Down

- ✓ For SAW users only

The Levelizer and Reverberator can be judged using your own ears. Download a free demo from [www.iqsoft.com](http://www.iqsoft.com) contact the company in Nevada at (800) 844-1554 or circle Reader Service 125

SAWs in tandem with other processing and mastering programs. The Levelizer brings onboard processing capabilities to a level where resorting to other programs to polish production is unnecessary.

The \$150 download from [www.iqsoft.com](http://www.iqsoft.com) for the Levelizer makes the program a terrific bargain when compared to the numerous hardware solutions required to match its capabilities.

### How 'bout the reverberator?

IQS Reverberator plug-in is another handy tool. It uses the same comb/all-pass filters found in other units. More filters can be added making for high-



The key listen previews audio by listening to the triggered gate and compression for an accurate adjustment of EQ. Other compressors, gates and limiters lack monitoring, which makes it impossible to judge the amount of processing. The gain reduction meter solves this problem.

A Pentium 233 showed that the gain reduction meter is fast. To my eyes and ears, there was no perceptible latency. As with all IQS products, this is a tight, hand-coded software.

I found the Levelizer simple to use and easy to master. Producers often use

quality sound.

The 20 comb filters and 20 all-pass filters can be set with 38 presets to mimic the ambience of almost any space — from a small room to a stadium. The settings control dry/wet mix and room decay time.

A visual display representation shows the impact the filters have in shaping the sound. The stereo simulator adds ambience to mono tracks.

The Reverberator sounds rich and detailed. Again, for \$150 download, it's a great piece of software.

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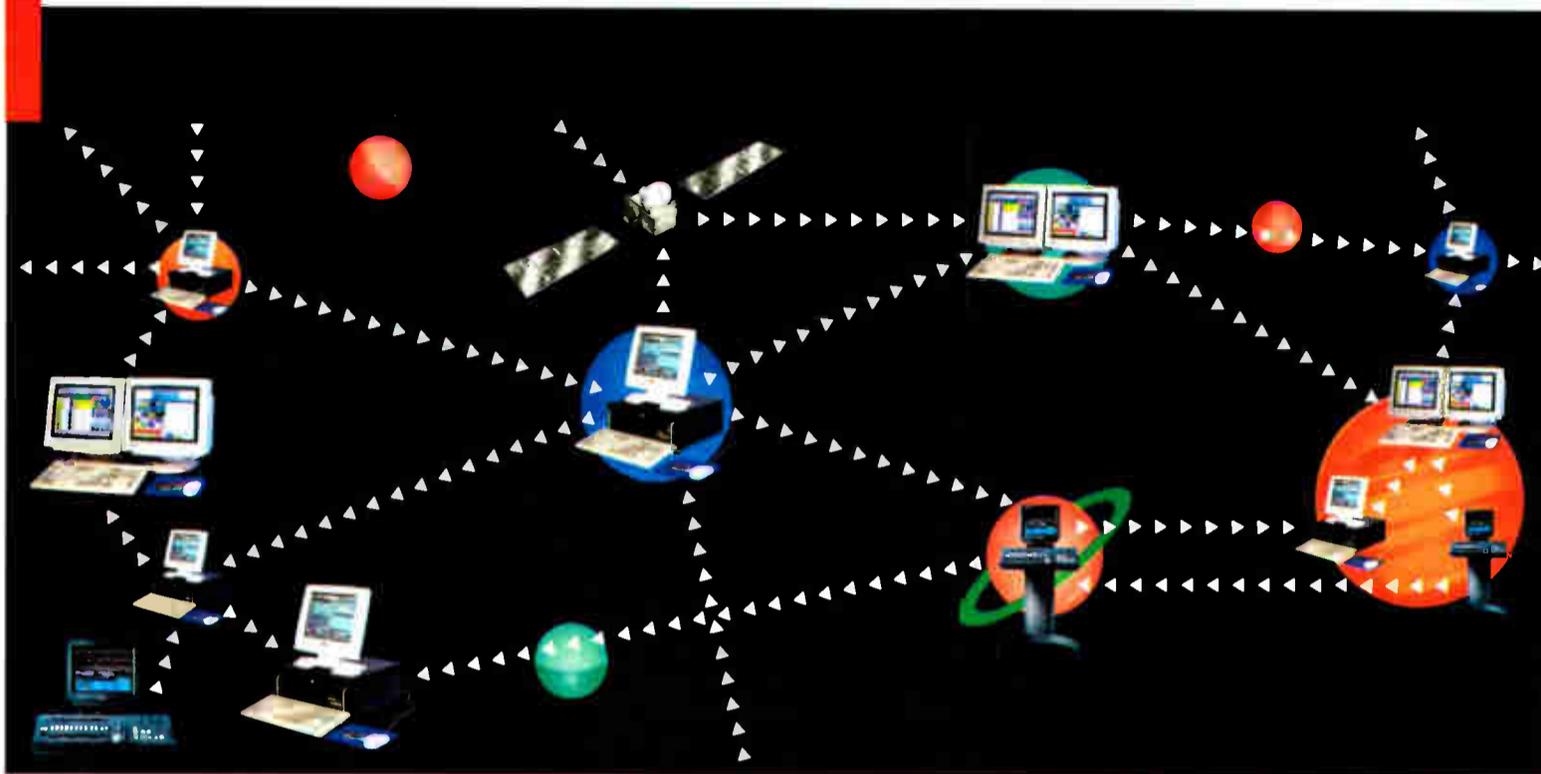
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# Pellegrini Makes It to the Majors

► WLS, continued from page 31

Shortly Pellegrini landed at WKLQ(FM) in Grand Rapids, Mich., as production director.

"I finally got married and we wanted to live in Chicago or Los Angeles. I sent out 20 tapes to each market and the only call back was from Mike Elder, operations manager at WLS." That was March of 1997. Pellegrini got the job.

"There were two people who helped me out with the commercial voices —

dles those in a separate studio connected by a network interface.

"Mike Elder writes a lot of our promos but we use the former WLS production director, Jeff Davis, as the station voice. He records the basic tracks at his Hollywood home and sends them to us on ISDN, then I mix them with the music beds here."

Pellegrini finds it frustrating not being able to use anyone in the station for extra voices. "Only union talent allowed."

lite downlinks." Pellegrini has a VCR in the production room, allowing him to grab audio from events such as Chicago Bulls games or other breaking news courtesy of ABC.

## Getting philosophical

"I've always felt that equipment and technology are great, but if the writing isn't creative, nothing will help. All the music beds and sound effects don't mean much if the message isn't worth listening to," said Pellegrini.

"The best commercials are ones that have the best writing."

Pellegrini has a higher goal than just recording spot after spot each day.

"I want to change the advertisers' philosophies. Many see radio as an extension of the print ads.

"When I began here, a salesman wrote almost every spot starting with a question and ending with a phone number. They may think it is efficient, but when all spots sound alike, how efficient is that?"

To put it mildly, John Pellegrini loves what he does.

"Mike Elder is the best boss I've ever had. It's great to be involved with a station that has an internal dynamic with pros wanting to keep winning and growing. It's a wonderful job."

■ ■ ■

*Ken R. is president of Ken R. Inc., and ID jingle production firm located in Toledo, Ohio. He is a frequent contributor to Radio World.*

**I want to change the advertisers' philosophies. Many see radio as an extension of the print ads.**

— John Pellegrini

Karl Gaisser, the assistant program director, and Nancy Turner, who was a personality on WLS(FM) when it was a country format. I write about one-third of the scripts for the commercials and the rest are supplied by agencies."

Pellegrini is a hands-on production person except when it comes to dubs. Engineering Assistant Pam Murphey han-

WLS has the International Brotherhood of Electrical Workers union, with American Federation of Television and Radio Artists presiding over the technical areas and having jurisdiction over the voices.

"I'm on salary," said Pellegrini, "so I'm paid the same whether it's five spots or 20 in a week. Usually it's more like 20."

## Tools of the trade

Pellegrini uses a Pacific Recorders ABX-34 mixer, which he calls a "monster board," and an Orban Audicy digital workstation.

"I used to have a callous on my left index finger from all the razor blade cuts, but we've come a long way since then," he said.

"I like the Audicy because it has its own control panel and is not mouse-based. Before, I was using a Roland DM 800. The change was like going from a Yugo to a Porsche. It's very intuitive. I was up and running on it within two hours. If you run into a problem you hit the 'help' button and it tells you what to do."

Pellegrini said the instruction manual for the Audicy is written for a producer's point of view, rather than the engineer's.

"Another advantage is that there is over 60 minutes of memory per project so it can handle multiple versions of spots with tags and inserts."

WLS used tape cartridges until two years ago, switching to Broadcast Electronics AudioVault for storage.

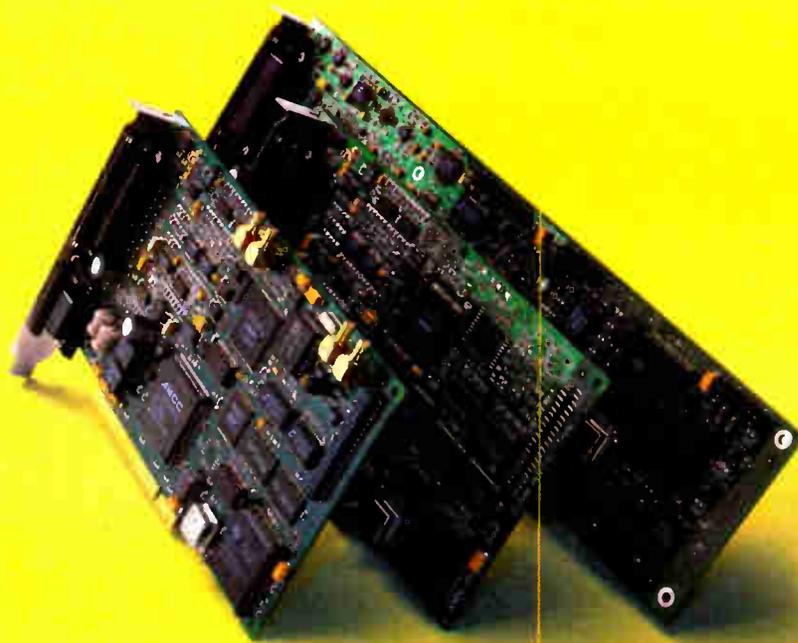
"There are four stations here, each of which has four separate studios. The morning show alone had over 10,000 carts. We are putting everything into the same AudioVault."

Most of the audio processing is done within the Audicy software, but occasionally he uses a trusty Eventide H3000B Harmonizer or Ursa Major Stargate 328 Digital Reverb for weird flanging effects. Compression is usually handled within the console.

"We have a whole bank of switchers," said Pellegrini. "These enable me to call up any control board on AM or FM, or WLS-TV ABC 7 feeds from downstairs. I can get the pressroom at city hall or satel-

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## WLS(AM)/WXCD(FM) Production Equipment List

### Board

Pacific Recorders & Engineering ABX-34

### Computers

Orban Audicy for production  
Broadcast Electronics AudioVault for storage and on-air delivery  
Windows NT

### Outboard Efx

Eventide H3000B Harmonizer  
Ursa Major Stargate 328 Digital Reverberator

### Decks

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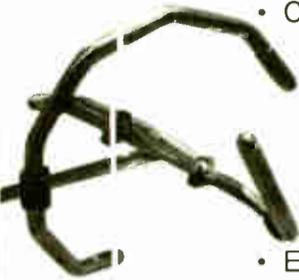
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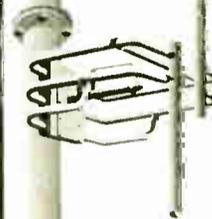
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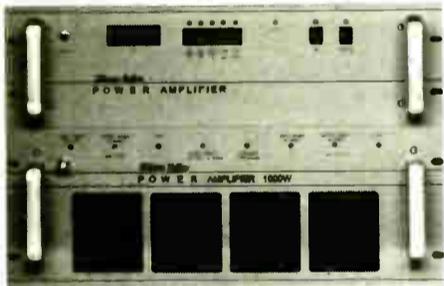


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## PRODUCT GUIDE

## Scaled Down ProTools

The new Digidesign Digi001 for Mac, targeted for home studios, may find a home in radio applications as well.

With a suggested price of \$995, it is a 24-bit audio and MIDI digital audio workstation that draws from Digidesign's TDM-based ProTools sys-



Multi-Channel I/O Breakout Box

tems. A version for Windows will be available in early 2000.

The package includes a PCI card and a multi-channel I/O breakout box for rack-mount or desktop that provides eight analog inputs, two with mic pre-amps, -26 dB pads and 48V phantom power, the other six with software adjustable gain. It has eight analog outputs, separate monitoring outputs, S/PDIF and ADAT optical I/O, for a total of 18 including the two digital I/Os.

The box also has MIDI I/O, a 1/4-inch headphone jack with volume control and 1/4-inch footswitch jack for record punch-in.

In addition, Digidesign released the Digi Toolbox XP with a suggested price of \$545, built around ProTools LE software and the Audiomedia III PCI card, offering two channels of 18-bit analog I/O and S/PDIF digital I/O.

ProTools LE introduced the Real-Time AudioSuite (RTAS) plug-in architecture, for real-time host-based mixing and effects processing. RTAS plug-ins are an extension to AudioSuite file-based plug-in specs supported in TDM-based ProTools setups.

Both Digi001 and Digi Toolbox XP systems include RTAS versions of several DigiRack plug-ins, including EQ II, Dynamics II, Dither and Mod Delay. D-Verb is included for a limited time as a special promotion.

The company will release its Maxim and D-Fi plug-ins in RTAS format soon. RTAS plug-ins from Waves, Wave Mechanics, DUY, GRM Tools, Bomb Factory and Arboretum are on the way.

Both Digi 001 and Digi Toolbox XP can be upgraded by Digidesign's exchange program for TDM-based ProTools systems. Visit [www.Digi001.com](http://www.Digi001.com) for details.

In related news, Digidesign allows MP3 export as an option for ProTools v5.0 and ProTools LE v5.0; the option is only available for the Mac. A 30-day fully functional preview version is included on the installer disk supplied with ProTools v5.0 software. Users who wish to purchase the program can download it from the Web site at [www.digidesign.com](http://www.digidesign.com) for \$19.95

Digidesign will start distributing Focusrite hardware and software in North America and the LexiVerb plug-in worldwide starting in 2000.

For information, contact the company in California at (800) 333-2137, check out the Web site at [www.digidesign.com](http://www.digidesign.com) or circle Reader Service 80.

## Millennium On-Air Sweepers

Image 2000 is a new sweeper package released by Marketing Mania Studios, featuring the voice talent of Jennifer Vaughn. It contains 75 liners with a "millennium and beyond" theme, aimed to brand radio stations in any format.

The release date for the first package "point of entry" was Dec. 10.

To obtain a demo, contact Kevin Russell in Florida at (941) 574-6850, visit the Web site at [www.jennifervaughn.com](http://www.jennifervaughn.com) or circle Reader Service 63.

## Drawmer Has Radio Uses

Drawmer released the Masterflow DC2476 Digital Signal Processor, which will retail for \$2,995. It is a 24/96 all-digital processor with AES and S/PDIF I/O plus analog I/Os. It has features that make it useful to radio broadcasters for on-air or in the production studio.

The unit is designed for flexibility in processing, with six processors available and presets to load settings. For broadcast, it has been designed to make overload impossible and automatically bring level up to 0 dBfs.

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Factory and user patches stored internally or on a RAM card. Future upgrades include an outboard interface between the unit and a PC for downloading product upgrades off the Web.

For more information, contact the company in California at (805) 375-1425, check out the Web site at [www.transaudiogroup.com](http://www.transaudiogroup.com) or circle Reader Service 47.



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# Crown Broadcast... making a world of difference

# Mic Excels in Vocal Frequencies

► MIC, continued from page 31  
was indiscernible.

The TLM 103 is smoother and thicker in the bottom. Both have a similar midrange, but the AT4047 has a bite in the top and a more open upper midrange presence.

Both mics develop "phases" artifacts at 45 degrees off-axis and a low-frequency loss at 90 degrees. Rear rejection was good in both mics, with the Neumann losing more high frequencies off the back. Both distorted during the key jangle test, with the spectra of distortion being higher in the TLM 103 and lower in the AT4047.

For voiceover work, the low-frequency proximity boosts of other large-diaphragm condenser mics get in the way

when used closer than six to eight inches. Without the 80 Hz 12 dB per octave roll-off, the AT4047 exhibits proximity, but less than the TLM 103.

I could work a quiet voice within one inch of the grille, but not without eddies or popping. With the roll-off engaged, I could easily work up close with only minor pops and eddies.

With a pop screen and roll-off, the AT4047 can be used on-air. With a foam ball, I lost a bit of the edge, but gained control over popping.

Regardless of the AT4047's bottom end, it has enough to require the bass roll-off and some EQ to keep the fifth and sixth strings of my Martin D285 guitar from booming.

At around 80 to 110 Hz, the roll-off on

the mic and the 75 Hz 18 dB per octave filter on the Mackie are below the problem frequencies.

Tracking flat and then into the Orban Audicity workstation with the AT4047 about six inches out from the sound-hole, I found that I could rebalance the bottom by pulling down 7.7 dB at 118 Hz with a 0.28 Q.

Next, I pulled the mic back to one foot because the spec sheet noted the mic should provide a flat response at that length. Shooting right into the sound-hole, I recorded flat. This time, without changing the Q, I only needed to drop 110 Hz by 3.8 to 4.9 dB.

At about a foot out from the neck/body joint and angled to the sound-hole, I still got a full bottom that

See MIC, page 41 ►

## Product Capsule: AT4047/SV FET Cardioid Condenser Mic



### Thumbs Up

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- ✓ What's not to like?

For more information, contact Audio-Technica, in Ohio at (330) 686-2600, check out the Web site at [www.audiotecnica.com](http://www.audiotecnica.com) or circle **Reader Service 61**.

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► MIC, continued from page 40  
required some LF cut.

For music recording, having a room that does not contribute negatively to a mic a foot away from the source is essential. Otherwise, you will have to move in and deal with proximity.

In comparing the midrange, the TLM 103 has a lower midrange peak, while the AT4047 has an upper midrange presence. That makes the TLM 103 warmer and thicker and the AT4047 clearer and more open.

I stopped at Flite Three in Baltimore to put the AT4047 up against the U 47 FET and U 87i. Working with engineers Louis Mills and Mark Patey using an API console, we found the AT4047 sounded more like the U 87i than the U 47 FET. The AT4047 was brighter in presence than both Neumanns.

My earlier test through GML mic preamps gave an edge reminiscent of API mic preamps, but the GML does not produce any edge. I ascribed the edge to the sound of the AT4047's transformer.

The combination of the API mic preamps did not increase the size of the teeth in the edge as much as it sounded like twice as many teeth of the same size.

The key jangle test at Flite Three supported earlier listening experiences. All mics crunched a bit, the AT4047 crunch showed its affinity for upper midrange presence.

We did notice one anomaly while recording Tom Olsen, a local V/O talent. At a distance of six inches, the U 47 had

more edge, while the AT4047 lost some.

The U 87 exhibited more bass than the AT4047. At six inches, the Neumann popped, but did not splat. The AT4047 was more resistant to woofing but not popping.



L-R Joel Singer, Artist Michael W. Smith and Eric Elwell at the 1999 NAMM Summer Session

At one foot, the bass response of the AT4047 dropped off more than the U 87. However, we still did not tailor the bass for the voiceover recording.

Olsen felt the U 87 had a bigger bottom, while the U 47 sounded even across the spectrum and the AT4047 offered more midrange.

The agency producer then chose the AT4047 on Tom's voice to cut the spots.

Without EQ, the midrange presence allowed Tom's voice to ride nicely over the music track.

We found the sweet spot of the AT4047 slightly wider than the U 87. At a distance of about four inches, an inch

Because I had been able to get in closer at my studio, I can guess the difference in preamp/mic coupling were responsible for the differing results.

The AT4047 picked up more high frequencies from the rear side and grille top than the U 87. At a distance of four feet, the AT4047 heard more room while the U 87 heard less room but the self-noise was more apparent.

To my knowledge, this is the first A-T mic "with an attitude." Engineers should get past preconceived notions about A-T and try out the AT4047/SV.

The first 600 were sent to the distributors in a tweed road case. If you are quick, you may be able to get one.

■ ■ ■

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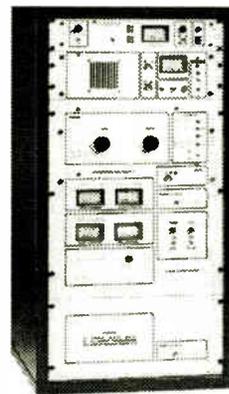
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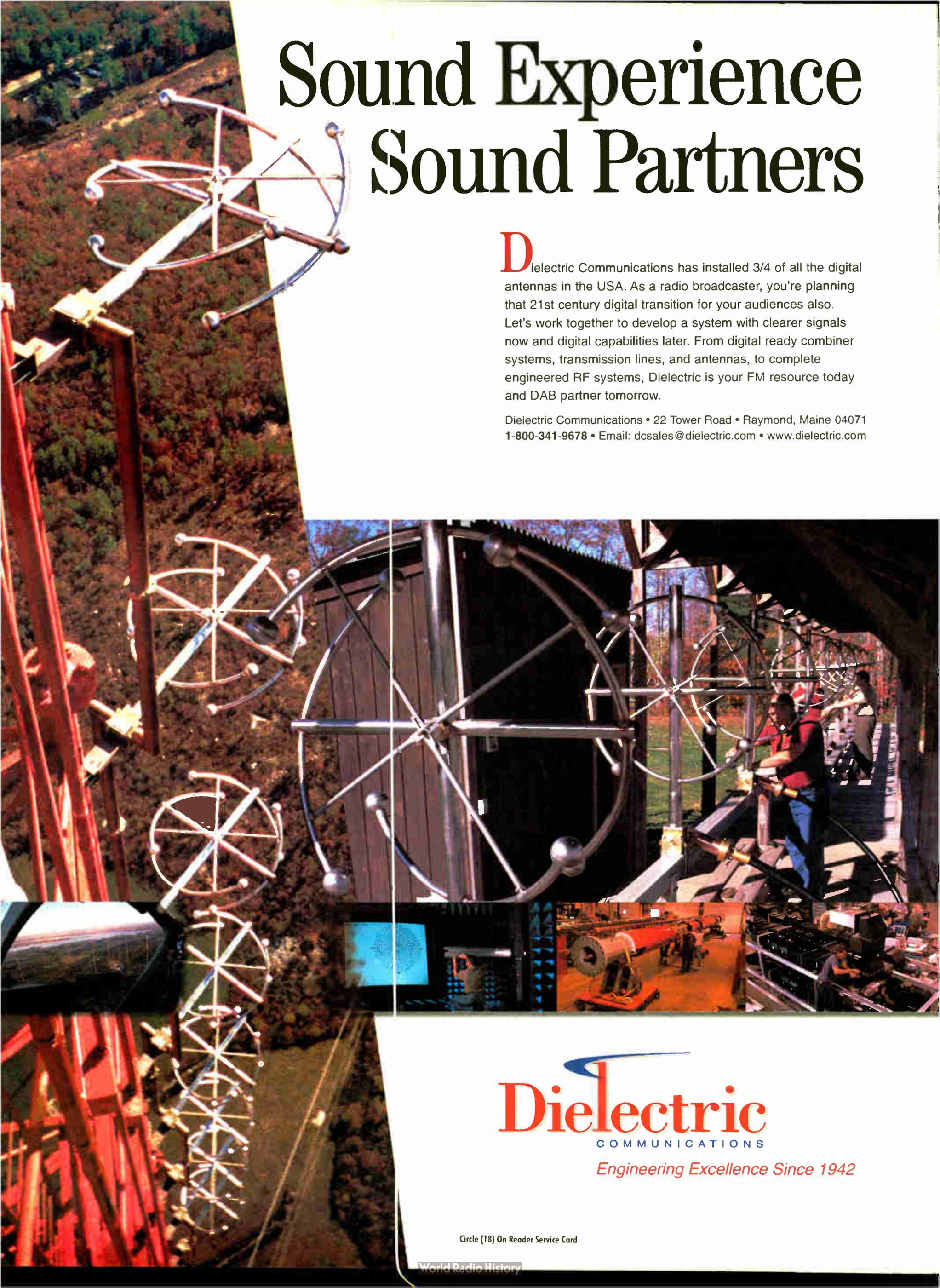
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World Radio History

# Buyer's Guide

## Tech Updates



Inside

Radio World

Antennas, Towers & Peripherals

December 22, 1999

USER REPORT

## Antenna Concepts Tames Terrain

by Randy Pugsley  
Technical Director  
CBS/Infinity Broadcasting

**PORTLAND, Ore.** One of the biggest technical challenges faced by FM broadcasters is that of delivering a high-quality signal in the hills and canyons of the San Francisco Bay area. During my 20 years as a broadcast engineer in San Francisco, this was also a serious personal challenge for me.

As chief engineer of KOIT-FM, part of my problem was that the transmitting antenna is located on the famous Sutro Tower. Because of its size, antenna patterns of FM stations have suffered from "holes" where the coverage is shadowed by the tower, and from multipath in other areas due to reflections from this massive steel structure.

### Quality service

KOIT-FM was one of the original occupants when the Sutro Tower was built over 25 years ago. Over that period, KOIT-FM has installed four different FM antennas in the attempt to eliminate shadows and multipath so as to provide quality service to the San Francisco Bay area.

The first antenna installed for KOIT-FM was a panel-type (wrapped around one of the tower's huge legs), directionalized and distorted, but not by design.

The second was a three-bay, full-wave spaced "rototiller" at the fifth-level of the six-level tower.

The station still received many complaints of RF interference to television reception from homes located on Mount Sutro. I decided it was time to reexamine our antenna scheme.

In the early '90s, we replaced that antenna with a six-bay half-wave spaced rototiller on a lambda tower

section, the best technology available at that time. While this improved RFR and interference, we still had serious multipath and inconsistent coverage in many areas.

new antenna site. This was unacceptable, as we would lose our grandfathered power and height at the Sutro Tower site.

Our "big break" came in early 1997, when I discussed the problem with Lee

Lee told me that he had been working with Antenna Concepts to resolve similar problems for some of the Z Spanish Media stations, and he showed me some impressive results.

Lee's work with Antenna Concepts had contributed greatly to the new design that does away with unwanted side lobes, wasted downward energy and deep nulls.

About the same time, I learned that KOIT-FM would have to give up its location on the fifth level of Sutro. However, I also learned that Sutro Tower Inc. would cover the cost of moving the KOIT-FM antenna, or of installing a new antenna on the north-east spire just below the Channel 32 antenna.

I immediately arranged a meeting with Lee; Talmage Ball, vice president of engineering for Bonneville Broadcast; and the station manager. Lee was given the opportunity to design what he terms his "biggest accomplishment."

The results were beyond our expectations. Almost all of the multipath problems we had endured for years simply disappeared. KOIT-FM has the cleanest signal in San Francisco, and we got calls from listeners in Santa Rosa, Sacramento and Monterey.

The 24 kW signal is now outperforming some San Francisco stations with 100 kW and more. The antenna also exhibits superior bandwidth, which we measured with a network analyzer.

Equally impressive, and perhaps more important to the KOIT-FM staff and management, Arbitron ratings for the San Francisco market area show that KOIT (AM and FM) climbed to No. 1 (target audience, persons 25-54) in the first book in 1998, and KOIT-FM remained there for every book in 1998.

For more information contact Antenna Concepts in California at (530) 621-2015, fax (530) 622-3274, visit [www.antennaconcepts.com](http://www.antennaconcepts.com) or circle Reader Service 53.



Sutro Tower, San Francisco

Antenna manufacturers and consultants told me that little or nothing could be done to improve the KOIT-FM signal short of a

Granlund, director of engineering for Z Spanish Media Corp. and a design engineer I've known for almost 25 years.

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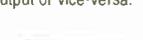
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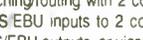
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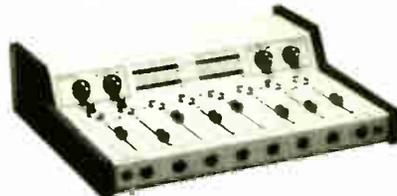
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READER SERVICE NO. 177

USER REPORT

# Oldies Station Up In Smoke

by Peter Stohrer  
Chief Engineer  
WQLL(FM)

**MANCHESTER, N.H.** On Thursday, Oct. 21 at 1:02 p.m., Manchester, N.H., oldies station Cool 96.5 went off the air due to a misdirected dynamite charge caused by a blasting crew clearing ledge around the WQLL transmitting site.

WQLL's transmitting facility is located on the eastern side of Mount Uncanooc in Goffstown, N.H. As the station's chief engineer, I arrived at 1:30 p.m. to find the guyed Rohn 180-foot tower down and the building housing the transmitting equipment in an imminent state of collapse. The blasting mat,



WQLL's Transmitting Facility After the Blast

used to keep rock from becoming airborne, had come to rest on top of the building following the blast.

The station's General Manager Ray Garon arrived on the scene shortly after I did. WQLL is one of three stations in the Manchester, N.H., market owned by Saga Communications of Grosse Pointe Farms, Mich.

By 2 p.m. we contacted Steve Vanni of Technet Systems Group in Auburn, N.H., and Steve began to arrange replacements for the damaged equipment.

Workers from the blasting company were able to remove the transmitting equipment once the building was safe from collapse.

WQLL was off the air for just a short time as a temporary transmitting location was constructed on the transmitter building of sister station WZID(FM) located on the other side of the mountaintop.

**The cleanup**

WQLL's directional antenna was totaled in the accident. Steve immediately contacted **Shively Labs** in Bridgton, Maine, and work began on the replacement antenna and directional study the same day.

The new installation also required a bandpass filter due to the proximity of the WZID antenna, and by early in the week of Oct. 25,

See SHIVELY, page 46 ▶

USER REPORT

# Skytiller Broadens Coverage

by Lee J. Freshwater  
Director of Engineering  
Asterisk Radio Group

**GAINESVILLE, Fla.** When Asterisk Communications was faced with a possible antenna replacement for one of our stations, we turned to **Harris and Dielectric** for advice. After consulting with Jim Thomason at Harris, we chose the new Skytiller antenna.

An SKM-2E two-bay was purchased for our 99.5 WBXY(FM) facility and an SKM-3E three-bay for our 104.9 WXJZ(FM) rebuilding project. The results and service were better than expected.

In February 1999, our new CP on 99.5 went on the air. But our new Harris Z-5 showed a VSWR of 1.25:1. Tests showed the transmitter and line were working perfectly, but there was something wrong with the antenna or its installation.

Negotiations with the antenna manufacturer, tower crew and tower owner did not solve the problem. Because we were also looking for an antenna for our newly acquired 104.9 property, the decision was made to replace the antenna.

**Strong construction**

The Skytiller can be configured as a center or end-fed antenna. The rugged construction will provide many years of service withstanding the most-severe weather and wind velocity up to 150 mph.

We found the published VSWR specifications to be much lower in the field. A new feature available for SKM antennas is an optional fine matcher to fine tune the antenna for minimum VSWR.

The antenna arrived on time. We were impressed at the way it was packaged for shipment. All parts were foam wrapped, then paced in heavy-duty cardboard boxes. Shipping damage would be virtually impossible with normal routine handling. All the instructions were plainly written, with large diagrams for the crew to follow.

The old antenna was lowered to the ground in preparation. As much assembly as possible was done on the ground, then each bay was individually hoisted in place on the tower for installation. This ensures that too much stress is not placed on the bay connections.

Once completed, the transmission line was connected and purged. Install time was about two hours, with another hour for purging of the antenna.

Power was applied to the transmitter. The first thing I noticed was the reflected wattmeter did not move. Transmitter power came up to 2.7 kW, with no VSWR. The transmitter VSWR showed 1.00 and the Bird meter VSWR showed less than two watts.

We had lowered the VSWR from 1.25:1 to 1:00:1. Because we share a tower with a station on 92.5, their system was also checked for possible interference from the new antenna but no problems were found. However, the question remained — would our signal improve?

With the tower site six miles north of Gainesville, we always had a signal problem in South Gainesville near the

University of Florida. We immediately noticed an improvement in our signal around the Gainesville area and a great deal of our multipath problems were gone.

We also recently installed the new three-bay Skytiller at our 104.9 facility. I can now receive this Class A station some 50 miles away with a portable receiver.

In today's consolidated broadcast world, engineers look hard at reliability. The new Skytiller was installed on July 19, and has gone through two months of the most-vicious lightning

Florida can provide.

Along with the safety features of the Harris Z-5, we have had no down time since the installation. We were so impressed with the Skytiller that it will be our choice for our next antenna upgrade.

*The Skytiller antenna products are manufactured exclusively for Harris by Dielectric.*

*For more information contact Harris Corp. Broadcast Division in Indiana at (800) 622-0022, fax (765) 966-0623, visit www.harris.com/communications or circle Reader Service 91.*

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The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks



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## USER REPORT

# Cortana Stati-Cats Protect, Serve

by Mark Persons  
Owner, Broadcast Engineer  
M.W. Persons and Assoc. Inc.

**BRAINERD, Minn.** Lightning happens almost anywhere. The difference between one location and another is the frequency of lightning strikes per year. Florida gets the highest number of lightning strikes.

Our company and most of our clients are in the state of Minnesota. We are a long way from Florida, but that does not exempt this area from lightning damage.

## Damage is a shock

At least twice each summer, I am called to repair lightning damage.

It can take a toll — financial damages to a facility start at \$500 and go up from there.

One of our clients suffered \$18,000 damage from a single lightning strike this summer. That radio station would have spent four days off the air if there had not been a backup transmitter available.

The majority of lightning damage occurs at facilities where there is no lightning protection. Most people are mistaken when thinking a lightning rod at the top of a radio tower is lightning protection.

All the rod does is provide a convenient place for lightning to strike. The rod will only protect the tower beacon light next to it.

In the case of the station with \$18,000 damage, there was a lightning rod at the top of the tower. The station had extensive damage to an exciter, high-voltage rectifier stacks, low-voltage rectifier stacks, remote control and audio processing equipment.

## Getting protected

Cortana made Stati-Cats for better

lighting protection.

What can Stati-Cats do to prevent the problem or reduce the severity of a lightning strike?

It all has to do with physics. Stati-Cats have hundreds of sharp points, which bleed off static charges. That bleeding action creates a flow of electrons, like through a resistor, reducing the potential or voltage between cloud and ground.

The result is that the number of lightning strikes is reduced and the severity of a lightning hit is lessened. Some problem-prone stations have reported that their lightning problems have been virtually eliminated using Stati-Cats.

If sharp points are all that is required, why can't I build my own?

Tower maintenance is expensive, it is time-consuming and it is not a do-it-yourself project.

The best and safest answer is to purchase a commercially produced product with a long expected life.

## And your point is ...

Cortana uses stainless-steel rods that have been sharpened to fine point. Those rods are mounted in aluminum bars with a high-strength adhesive. This is not something I can imagine the average person making.

Even with stainless-steel points, a Stati-Cat may not last forever.

High discharge rates actually heat the points making them dull at the ends after years of faithful service. Stati-Cats should be inspected annually and repaired or replaced as necessary. If a Stati-Cat needs to be repaired then it has been working hard and doing its job.

Also, with a purchase of a Cortana Stati-Cat, users get professional advice on how many stainless-steel points would be right for an individual

situation. That advice is worth as much as the product itself.

I recommend Cortana Stati-Cats for all installations.

There are even some small inexpensive ones for STL towers. As far as I am concerned, they are cheap at twice the price.

Mark Persons is an SBE-certified Professional Broadcast Engineer. He built 14 new radio stations and rebuilt many others in the past 20 years.

He can be visited at his Web site <http://mwpersons.com>

For more information contact Cortana Corp. in New Mexico at (888) 325-5336, fax (505) 326-2337 or circle Reader Service 54.

## TECH UPDATE

### SWR Combine Bandpass Filter

SWR is developing a new line of bandpass filters. A Combine Bandpass Filter design is being implemented.

The company said it determined product parameters such as performance and size according to the needs of broadcasters. Research for a suitable design method indicated that a quarter wave resonator, staged coupled design was best suited for the design criteria.

This design is a successive configuration of quarter wave resonator cavities iris coupled with probe tuning. For the first prototype, a two-stage design was done.

SWR plans to implement a full-scale model, which should be available in limited models for the second quarter of 2000.

For more information contact SWR in Pennsylvania at (814) 472-5436; fax (814) 472-5552; visit [www.swr-rf.com](http://www.swr-rf.com); or circle Reader Service 66.

# Shively Saves Station

► SHIVELY, continued from page 45

the antenna and filter were finished.

Steve also coordinated a number of other pieces of equipment and services including portable lighting, transmission line, surveyors and riggers to complete construction of the tower and antenna.

Installation was set for the following Saturday and equipment began to arrive by Tuesday.

On Saturday, Oct. 30, Shively delivered the directional antenna and filter to the site complete with radomes and a field service technician to assist in the installation of the antenna. At midnight on Oct. 31, the new Shively Labs antenna was lifted into place and the bandpass filters tuned.

The project, in spite of the circumstances, went off without difficulty due to the rapid response of Technet Systems Group and Shively Labs. As the new antenna was installed on Halloween, we at WQLL can truly say that it turned out to be, with the help of Technet and Shively, a real treat and no trick.

For more information contact Shively Labs in Maine at (888) 744-8359, fax (207) 647-8273, or circle Reader Service 92. Contact Technet in N.H. at (888) TECHNET; fax (800) FAX-4-SOS; or circle Reader Service 94.

## TECH UPDATE

### Propagation Systems

Propagation Systems has introduced a new line of "rototiller" FM high-power antennas.

This series of antenna is available in both high-power (FHR) and medium-power (FMR) versions and configurations of half- and full-wave spacing. The arrays are normally configured up to 12 bays, with inputs of either 1-5/8-inch or 3-1/8-inch EIA.

The design consists of two series-fed bent dipole elements to form a space-phased circularly polarized antenna. Because of the series feed, the antenna is fed internally and can be pressurized, minimizing weather-related VSWR problems.

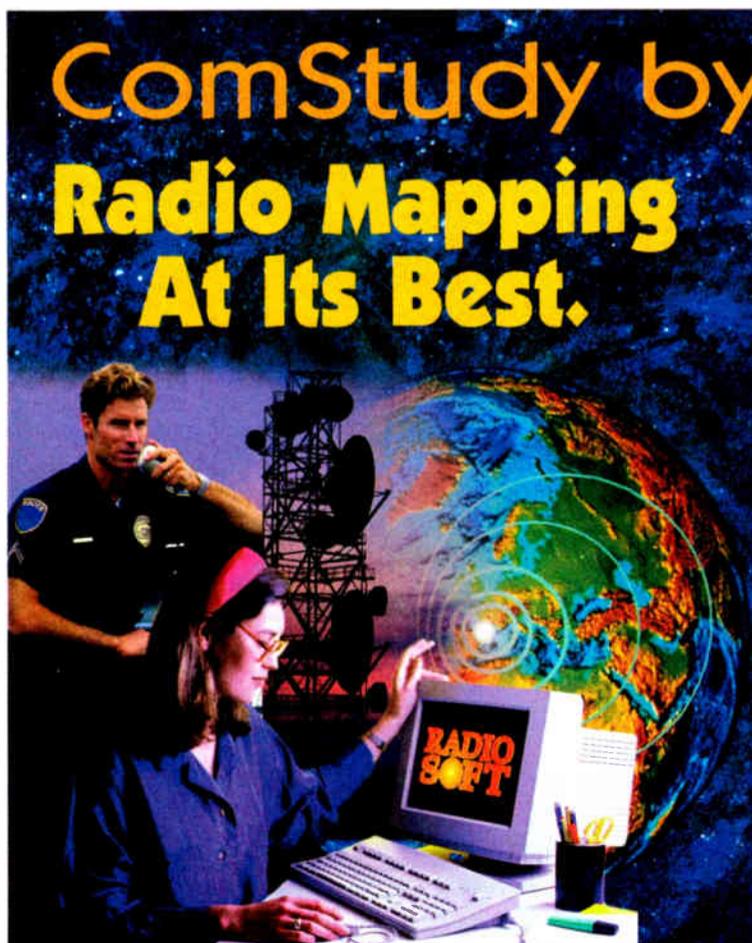
Each element and associated feeds are made of brass. Feed connections and flanges are TIG welded. Support brackets and hardware are of corrosion-resistant stainless or galvanized steel.

The FHR and FMR series come with a two-year limited warranty.

For more information contact Propagation Systems in Pennsylvania at (814) 472-5540, fax (814) 472-5676 or circle Reader Service 74.

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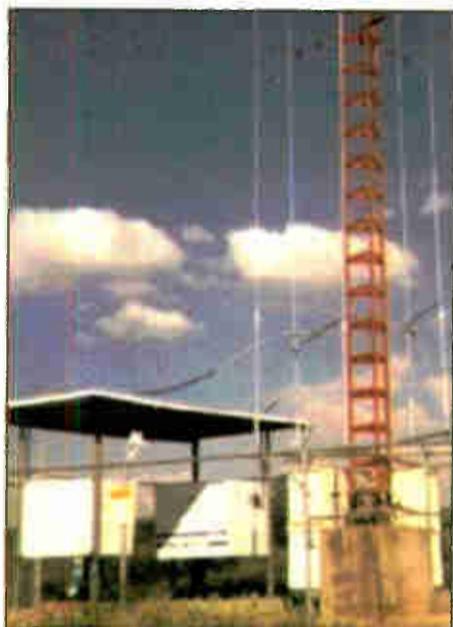
USER REPORT

# LBA Solves Signal Problem

by **Julio Cesar Martinez**  
**Engineer and Technical Director**  
**Radio Universal**  
**XELZ(AM), XECAA(AM)**

**AGUASCALIENTES, AGS., Mexico** Utilizing the LBA Technology Combipole antenna and diplexer system we solved an unfortunate coverage problem with our RF signal at XELZ.

Two of our stations, XELZ on 740 kHz, and XECAA on 950 kHz, were



LBA Technology's Combipole and Diplexer in Use at Radio Universal

sharing a conventional series fed tower and a diplexer. The approximate distance to downtown was five miles.

Within the city, the 740 kHz signal experienced fading and narrowing of the RF band. As a result, our engineering department was besieged with complaints telling us that the station did not have "presence," in some areas of the city "you could not hear it," and the station was "dull or deaf."

Of course, both stations have audio processing equipment and the audio quality at the console output was no different from the other stations of our group. The

link was operating correctly. When taking power measurements at the antenna, they were basically correct.

First, the diplexer was modified but to no avail. The changes were done using the same components. After two additional attempts to change the diplexer configuration we decided to purchase an LBA Combipole Antenna through a local LBA representative. However, we did not directly consult LBA Technology when making this decision.

The audio and the bandwidth improved after the installation of the Combipole. Nevertheless, there were still some problems with the presence

of the signal in some areas of the city.

We contacted LBA Technology by e-mail to ask them about the situation that we were experiencing and the staff was courteous and responded promptly. We sent them our diplexer configuration and told them about the problem. LBA replied suggesting a new configuration of the design and change of the diplexer.

We accepted their proposal and purchased the new LBA Technology diplexer. The diplexer came pre-adjusted from the factory and fine-tuning it on site was not a difficult task.

The cabinets have all the necessary elements to physically install them at the

base of the tower.

Now, despite the distance, XELZ has good presence and the audio quality has also improved. XECAA, which did not have problems, also experienced improvements in its signal.

Finally, the problem was solved with the installation of the LBA Combipole and new diplexer. LBA Technology's service and support to us were excellent and, in hindsight, we are sorry not to have contacted them earlier, because we could have expedited the process of providing high-quality service to our listeners.

Julio Cesar Martinez can be contacted by e-mail at [jcmartin@verona.fi-p.unam.mx](mailto:jcmartin@verona.fi-p.unam.mx)

For more information contact LBA Technology in North Carolina at (800) 522-4464, fax (252) 752-9155, visit [www.lbagroup.com/technology](http://www.lbagroup.com/technology) or circle Reader Service 62.

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TECH UPDATE

**Kintronic Laboratories**

Kintronic Laboratories seeks to meet the custom equipment needs of the domestic and international medium wave broadcast industry.

In the United States, Kintronics recently supplied phasing and multiplexing systems ranging from 50 kW DAB-ready DA-2 phasing equipment, to diplexed NDA systems with as little as 50 kHz separation between frequencies.

On the international front, Kintronics has designed, fabricated and is in the process of installing both a 400 kW three-tower directional system and a 100 kW four-tower parasitic array at separate locations for Transworld Radio.

For more information contact Kintronic Labs in Tennessee at (423) 878-3141, fax (423) 878-4224, visit [www.kintronic.com](http://www.kintronic.com) or circle Reader Service 57.



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Circle (26) On Reader Service Card

**TECH UPDATES**

**Litton Pressurization System**

The DSN2 Nitrogen Pressurization System from Litton is designed to provide concentrated nitrogen gas to any transmission line.

The product provides a source of dry gas at pressure designed to enhance performance of transmission towers with high signal quality and a reduced risk of component damage from voltage breakdown and corrosion.

Concentrated nitrogen gas offers different features over dry air, such as lower dewpoint levels (-60 degrees F or better), and is inert with less than 2.5 percent oxygen by volume nominally.

Each unit ships with 1/8-inch NPT straight fitting, 1/4-inch NPT straight fitting, 25-inches of 1/4-inch OD plastic tubing, and a shut-off valve.

The DSN2 can be mounted in a rack or on the floor or wall. All brackets and hardware are included in the shipping container.

For more information contact Litton Life Support in Iowa at (800) 548-8662, www.littonls.com or circle Reader Service 51. fax (319) 383-6125, visit the Web site at



**Mark Antenna Products**

New planar array antennas from Mark Antenna Products are designed to work with spread-spectrum radios at 2.4-2.48 and 5.725-5.85 GHz, licensed radios at 3.4-3.7 and 7.125-7.75 GHz and PCS repeaters in the 1900 MHz band.

In urban environments, where aesthetics and zoning are critical, the planar array was designed as an alternative to solid and grid parabolic antennas.

Planar antenna technology provides many benefits. The company says this technology, developed by Mark Antenna Products, brings intrinsic tolerance control, resulting in consistent antenna performance from one product to the next. Additionally, the planar array features a photolithographic microstrip process.

For more information contact Mark Antenna Products/CSA Wireless in Illinois at (847) 981-1188, fax (847) 981-9003, or visit www.markantenna.com or circle Reader Circle 52.

im·i·ta·tion \ im-ə-'tā-shən \ adj.

1: Resembling something else that is genuine and of better quality. 2: not real.

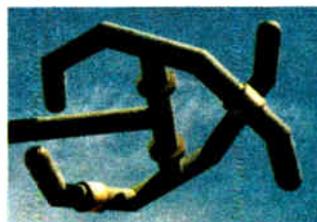
**BEFORE YOU BUY YOUR NEXT ANTENNA, MAKE SURE IT'S REALLY AN ERI-TILLER**

The Spring NAB show revealed numerous imitations of the famous ERI tiller style FM antenna, complete with their derivative of the industry christened "roto-tiller" name. But, is it really as good as the genuine article?



Do the imitators have the assurance of performance guaranteed by ERI's 55 years of experience and 24 years of "ERI-tiller" fabrication knowledge.

Well, no. But, we are eager to try and have some good ideas.



Will the imitators be able to provide same day parts and 24 years of assembly experience?

Give us a few years and we'll be able to figure it out.



Do the imitators offer full scale antenna range measurements and an extensive library of tiller style antenna patterns?

Scale models are almost as good and we are accumulating some patterns.

How many of their antennas have actually met their advertising claims?

Well, if you want to be technical, NONE.



"I am flattered by the imitations of the ERI-tiller design. I actually thought many of their supposed improvements were a good idea, 25 years ago when ERI first tried them. But, the fact remains, the ERI-tiller is the best antenna design and only ERI can make it. To insure the quality you have learned to expect specify the ERI-tiller by name. Don't be fooled by an imitation."

Tom Silliman, P.E.  
President, ERI

There are no imitations of an ERI lambda mounting and tower system. Allow ERI to construct your antenna-tower package with the best equipment at the best price.

To prevent customer confusion the ERI FMH and FML series FM antennas are no longer available. Current owners may contact ERI directly for parts and service. All ERI products remain available from other vendors. Contact ERI for further details

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ELECTRONICS RESEARCH, INC.  
www.ERInc.com

**Nott Linear Ferrite RF Choke**

A linear ferrite RF choke, designed for eliminating power pole interference, is available in two forms from Nott Ltd.

The first version is an insert choke, for situations in which the power company will allow the wire to be cut.

The wire through the choke is the same gauge as the pole ground wire. To install, a segment of ground wire is cut out equal in length to the choke. Split bolt connectors are furnished with which to connect the choke into the ground wire. Clamps are furnished with which to attach the linear choke to the wooden pole. Being gray in color and of small diameter, it is unobtrusive.

The second version, if the power company will not allow the wire to be cut, is a kit consisting of special split toroid beads, cement and a weather resistant plastic sleeve which is placed over the beads after installations. It is somewhat time consuming to install, but is designed to be as effective and unobtrusive as the linear choke described above.

The chokes are designed for long-term service, but the company suggests a periodic visual check be made at intervals of every year or two.

For more information contact Nott Ltd. in New Mexico at (505) 327-5646; fax (505) 325-1142; visit www.tjantenna.com; or circle Reader Service 112.

**PiRod**

The SU Series from PiRod is a new flexible-design series of solid-rod towers for the broadcast, cellular, PCS and mobile radio markets.

The SU Series features solid-rod legs and solid structural members for long service life and prevention of internal corrosion. The single-rod legs are designed to reduce ice accumulations, resulting in lower wind loads.

Other features of the SU Series towers include knock-down design, welded climbing loops and adaptability to most existing antenna mounts.

For more info contact PiRod Inc. at (219) 936-4221, visit www.pirod.com or circle Reader Service 73.

# Radio World Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

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Custom built Altec-Lansing A323B monaural, pwr amp, push-pull 6L6 output tubes, BO, transformers worth over \$350. M Crosby, 408-363-1646.

## ANTENNAS/ TOWERS/CABLES

### WANT TO SELL

Andrew L44-N 1/2" connectors (8), new in boxes, \$20/ea; Andrew 87-R 1-5/8" connectors (24), \$125/ea. C Bryson, 724-776-5204.

Custom made 12-bay antenna tuned to 96.5, less than 1 yr old, call for details. Steve, 915-658-2966.

ERI 3 bay FM circ pol tuned to 102.3 MHz in excel working cond. BO. J Kimel, 802-864-4321.

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470' SOLID ROD TOWER, 2" legs, 100mph wind. Mark Barinowski, 706-733-1286.

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Dielectric 3-1/8" coaxial relay, Mike, 800-588-7411.

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Broadcast Tools ICM-16 (2), new, never used, (2) ICM16 controllers, ICM 16RM station, (15) ICM-16DT stations, \$2500/BO. Garry, 206-352-7560.

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AudioSource portable realtime spectrum analyzer, RTA-ONE in carrying case, battery/ac powered, internal mike, \$400; Gold Line RTA 1/3 Octave analyzer, LM27 one rack space, 3 LED system, \$250; calibrated mike, \$100; Shure M615, w/matching ES615 analyzer mic & case, \$350, trade for old bdct gear. M Hughes, 301-962-6823.

Ramsa WP9055 power amp, new, 2x50 W rms @8 ohm, 100 W rms bridged, new in box, \$380/BO/trade. M Hughes, 301-962-6823.

ANTEX AUDIO CARDS, WILL NOT BE UNDERSOLD. A.S.C. (619) 523-1575.

Urei 565 Little Dipper EQ, \$700; ADC Propatch 1/4" punchblock patchbays, new, \$600 (many); 1.4" TRS patch cords like new, \$15; ADC TT 144 point patch bays, recond, \$149-229. W Gunn, 760-320-0728.

### WANT TO BUY

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Audionics 200 control room monitor module for 200 Series board. J Snaper, 530-265-9073.

## AUTOMATION EQUIPMENT

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Antex SX-35 ISA audio cards (3), balanced I/O, w/manual & driver disks, \$150 ea/BO. Tim Backer, 315-472-9797.

## AUDISK SYSTEMS FOR SALE

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Digilink III, extra SCSI drive for addtl 24 hrs record time, gd cond/clean, \$2750/BO. P Wolf, 941-458-3777.

Smartcaster automation systems (3), one in service, two w/switchers & one w/o, all units used in satellite automation, \$4000/all.

### WANT TO BUY

Arrakis DL2, need not be Y2k ready, will pay \$1700 immed for operating unit. R Roberts, 800-524-3994.

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### WANT TO SELL

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## CART MACHINES

### WANT TO SELL

Harris 3 deck, gd cond, \$100. C Harper, 606-484-9393.

ITC R/P (2), 3 deck & (2) single play cart machines, have all three tones & are stereo, \$2000/all. J Parker Jr, 828-966-9518.

Fidelipac Dynamax CTR112 stereo, single play cart machines (5), \$800 ea +shpg, has fast forward, used for 6 mos & put in storage. B Lord, 206-932-4839.

## CD PLAYERS

### WANT TO SELL

Pioneer PD-F1004 100 disc CD player, \$100. C Harper, 606-484-9393.

Pioneer M403 6 CD player, \$120. S Petit-Homme, 914-966-3436.

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## CONSOLES

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EV EVT 5212, 12 chnl stereo mixer, like new, \$350. G Whittenberger, 765-985-2224.

McCurdy SS4000 & SS4388A manual/schematics & AM408A amp manual/schematics. Doug Walker, 519-654-0070.

Yamaha MX 200-12, excel prod console, gd cond, \$500. C Harpen, 606-484-9393.

Collins IC-6 in very gd cond, serviced regularly, \$1000. T Tabback, 520-282-4154.

Shure M267 prof portable mike mixer w/limiter, 4 input, Phantom pwr, battery/ac powered, clean cond, \$350; Ramsa WR-8210A, 10x4x2 mixer, ea chnl has 3 selectable inputs (mic, line, tape), 3 band sweepable (parametric) EQ, new/demo, \$1300 or trade for old bdct gear; Soundworkshop Series 30, 34, 40 parts, call for list, copies of manuals/schematics for 30, 34, 40, Arms II, BO or partial trade for mikes, effects, etc. M Hughes, 301-962-6823.

Logitek 12 stereo mixer. Mike, 800-588-7411.

Soundcraft 600, 24x8, \$3900; JL Cooper 16 trk automation, \$1200. W Gunn, 760-320-0728.

### WANT TO BUY

Soundcraft Delta 200 8x4x2 or larger. M Schackow, 605-374-3424.

Soundworkshop 40. A Polhemus, 212-302-9010.

## LIMITERS

### WANT TO SELL

Optimod 8100A in excel cond w/2 spare cards, \$2995 +shpg; Optimod 8100A SIT sub-chassis for discrete stereo studio-xmtr link, \$495 +shpg. T Burns, 815-625-2100.

Optimod 8100A in excel cond, \$2995; Optimod 8100A S/T sub chassis, for discrete stereo, \$475. T Burns, 815-625-2100.

CBS Volumax, \$400/ea; mint Urei 1176LNs, black, \$2300; 1176LN silver, \$1800; 1176 original blue/silver transformer I/O, \$2300. W Gunn, 760-320-0728.

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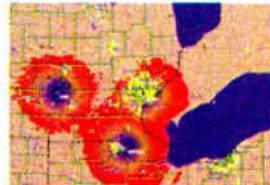
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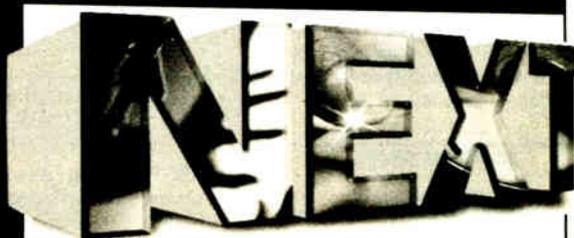
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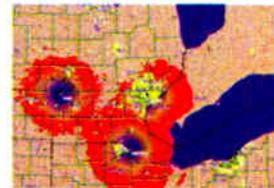
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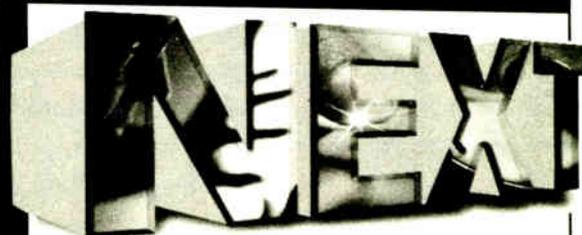
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Signature \_\_\_\_\_ Date \_\_\_\_\_

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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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◆ READERS FORUM ◆

Tube primer

Dear RW,  
I enjoyed James G. Withers' primer on tube technology ("A Screen Primer for the Tubeless," RW, Oct. 27).

As a young broadcast technician (26), I never had the opportunity to learn about tubes. My boss has been teaching me and I have been engaging in self-study on tube transmitters.

I am wondering if the series is available in an electronic format. I was going to add it to my transmitter file for future reference as I am studying for my GROL exam. I need all the info I can get my hands on.

Jason Knapp  
Engineering Technician  
RadiOhio Inc.  
Columbus, Ohio

Editor's note: Withers' three-part series is available on the RW Web site, www.rwonline.com

Digital radio is alive

Dear RW,  
Digital radio has just received a badly needed shot in the arm from the Federal Communications Commission. In my opinion, the release of the Notice of Proposed Rulemaking on DAB is potentially of history-shaping significance for the entire radio industry.

The prospects for both in-band and new spectrum digital radio suddenly look promising. The commission's

Prospects for in-band and new spectrum digital radio look promising.

leadership on this issue is nothing short of breathtaking: The 30-year-old TV-6/educational radio interference issue is dealt with, it provides for introducing LPFM-like services, protection for existing broadcasters, models for a cost-effective and rapid transition, dramatic new service opportunities, and the commission's need to set a standard and participate

as neutral arbiters of proponent testing, all addressed thoroughly and thoughtfully.

While there is a lot that can go awry as the issue moves forward, the commission's jump-start is bold and badly needed. If you haven't seen the NPRM yet, point your browser now to www.fcc.gov

(The link to text, Word 97 and Acrobat versions is available from the next to last item on the commission's home page.)

Comments are due Jan. 24, 2000, and replies by Feb. 22, 2000.

Mike Starling  
Vice President, Engineering  
National Public Radio  
Washington, D.C.

More LPFM opinions

Dear RW,  
With all this talk of LPFM and the FCC wanting diversity in ownership, consider the following:

First of all, we lost diversity partly because the FCC changed the rules on ownership, however this loss occurred mainly in the medium and large markets.

And second of all, very few LPFM stations will fit in the bigger markets. Most will be in the smaller markets, where there are still many owner-operated stations.

I would like to see a study on the diversity of radio station owners in the rural unrated markets. It seems the larger markets lack the diversity, and will remain that way if LPFM occurs; and the smaller markets will not become much more diverse than they already are.

Revenue is already tight in the small and unrated markets and the programming that makes a station local is usually the first to go when expenses must be cut.

Kevin Gluszcak  
General Manager  
WDKC(FM)  
Liberty, Pa.

Dear RW,  
LPFM has problems that could be catastrophic in nature to existing broadcasters. The existence of this service will undoubtedly be viewed as an open invitation to pirate radio operators. A new market for FM transmitters could grow substantially and new manufacturers could fill that need with low-

Wal-Mart Mentality

As we look into the next century, we're reminded to look back as well. Just like clothing styles, industry trends come and go. We must remember the past — the future may be more predictable than we think.

The late 1990s brought us the results of the Telecommunications Act. Fewer owners with more stations under their umbrella corporations. Will consolidation continue to flourish? Will there continue to be fewer jobs available? Or will the pendulum move the other way, with groups spinning off stations? Could mom-and-pop stations re-inhabit the marketplace?

Has our industry turned to a super-store Wal-Mart mentality? Whom, exactly, are we serving?

Radio has turned into a corporate-controlled industry, fair enough. But are we losing our perspective on the public interest? Why are full-service stations and newsrooms disappearing? We're not condoning the return of "Tradio" or small-town on-air obituaries, but we think folks like to know about water main breaks, city council goings-on and local high-school football playoffs, as well as the occasional tornado or food drive. These are not inconsistent with stock performance.

Mom and pop may never return, but it is radio's responsibility to foster a sense of community. Play requests. Broadcast local election outcomes. And as we've written before, stations that do serve their communities well must do a better job of trumpeting the things they do.

Satellite radio is knocking on the door. We will find out soon enough whether pay-as-you-go radio without local content can compete with us. But the more local we are, the more we will stand out from that new service.

While locally owned small-town radio may be a thing of the past, we believe it is possible to serve a community while at the same time answering to the corporate kings. Maybe that can be our New Year's resolution.

— RW

priced, low-quality units.

I would wager that many of these new "broadcasters" would not pay any attention to whether they are transmitting spurious emissions, too much power, or even be stable on one frequency.

How will we cope with high school students who buy their own transmitter and connect their portable CD players to them just for fun? What will we do when they have "Watt Wars" with each other?

LPFM has within it the seeds of anarchy and I doubt there is enough money available for the government to police the potential pirates. If the reason for this is because of less diversity of voices, then let the government reverse the law that created the problem in the first place.

Bruce Rogow  
San Diego

Off-base?

Dear RW,  
Regarding Carl Lindemann's response to Stephen Ickes letter in the Readers Forum in the Oct. 27 issue, Mr. Lindemann's remarks are totally off-base and without merit with regards to using

Macs for radio production.

There is a multitude of software for the Macs that are excellent for radio production, Digidesign's ProTools being just one example. Any software worth its weight either for Mac or PC is capable of less than the 24/94 Mr. Lindemann says is not intended for radio.

I would like to know if Mr. Lindemann could tell me the percentage of PCs and Macs used for radio production.

Geoffrey Grant  
Vice President  
Long Multimedia  
Needham, Mass.

Write to Us

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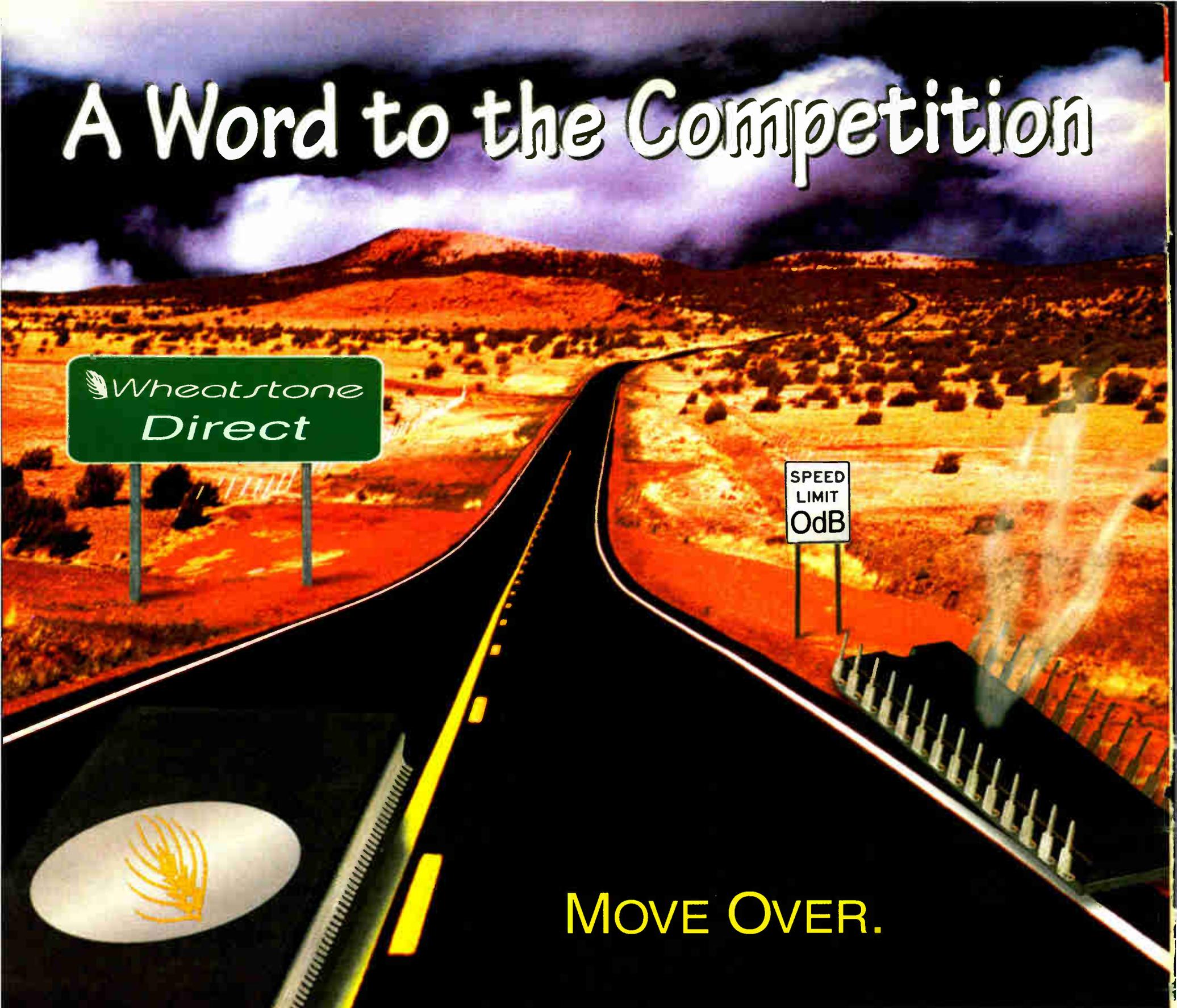
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