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Page 19

Page 37

# Radio World



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The Newspaper for Radio Managers and Engineers

December 19, 2001

**INSIDE**

**ENGINEERING**

▼ Fred Baumgartner on EAS, Dick Butler on DAB and John Bisset on last-minute holiday gifts.  
**Inside**



**GM JOURNAL**

▼ Are radio stations failing to keep women listeners satisfied?  
**Page 19**

**STUDIO SESSIONS**

▼ Bob Holiday cranks out the production for Salem in L.A.  
**Page 31**

▼ Ty Ford tries the HHB Radius 40 Tube Voice Processor.  
**Page 34**

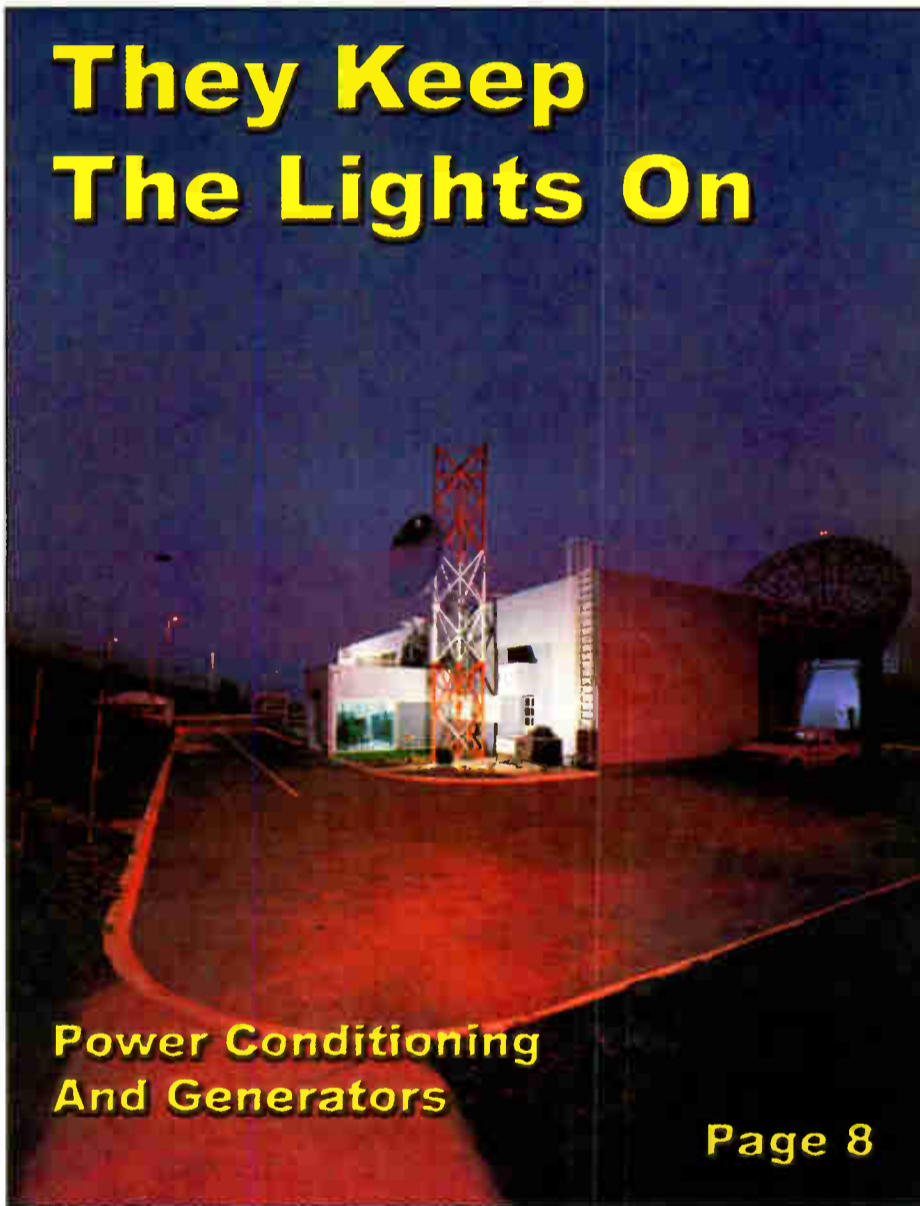
**THE MAX-WALL**

▼ A Kentucky reader wins a Modular Acoustical Environment Kit from Auralex Acoustics.  
**Page 4**



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## They Keep The Lights On



### Power Conditioning And Generators

**Page 8**

## NRSC Endorses FM IBOC

by Leslie Stimson

Ibiquity Digital Corp. has cleared an important hurdle on the road to commercial rollout of its in-band, on-channel digital audio broadcasting system.

The standards-setting body evaluating the viability and practicality of implementing IBOC digital radio has studied Ibiquity's FM system and declared it "a significant improvement" over analog.

**'Improved audio'**

The DAB Subcommittee of the National Radio Systems Committee has recommended that the FCC approve the system for use in the United States, specifically citing its "greatly reduced impact of multipath interference (for mobile, portable and fixed receivers alike); superior resistance to co-channel and adjacent channel interference; support for enhanced data services and improved audio quality."

In a more than 200-page document released in late November, the NRSC achieves a long-stated goal. After nearly a decade of encouraging IBOC  
See NRSC, page 6 ▶

Photo: Cummins



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# ◆ NEWSWATCH ◆

## Daschle Aide Next Up For FCC?

**WASHINGTON** Democratic Senate Majority Leader Tom Daschle has recommended his legislative assistant, Jonathan Adelstein, to the White House for nomination as FCC commissioner. If confirmed, he would serve out the term of former Commissioner Gloria Tristani, which ends mid-2003.

NAB supports the candidate. "Jonathan's commitment to public service and his firm grasp of broadcasting

and telecommunications issues will serve him well at the commission," NAB President and Chief Executive Officer Eddie Fritts stated.

## FCC Focuses on Communications Security

**WASHINGTON** As a result of the Sept. 11 terrorist attacks on New York and Washington, the FCC has created a Homeland Security Policy Council.

The purpose of the council is to evaluate and strengthen measures for protecting U.S. communications services, ensure rapid restoration of communications services and facilities that have been disrupted as the result of threats to, or actions against, the nation and to ensure that public safety, health and other emergency and defense personnel have effective communications available to them to assist the public as needed.

The Homeland Security Policy Council comprises senior staff from each of the commission's Bureaus and is directed by FCC Chief of Staff Marsha MacBride.

## Mackie Reorganizes, Cuts 48 Jobs

**WOODINVILLE, Wash.** Mackie Designs Inc. has implemented changes that it says will streamline product development, dedicate resources to customer service and prepare the company for an uncertain economy.

One change is the consolidation of Mackie's Product Development and Market Management groups into new market development teams: Live Sound Reinforcement, Recording/Broadcast and Contracting.

Mackie completed installation of an information management/network administration software on its computers company-wide and implemented changes in its Woodinville and Whitinsville

See NEWSWATCH, page 3 ▶

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## Index

### FEATURES

**How to Fight Sags and Surges**  
by Tom Vernon 8

**Workbench: Last-Minute  
Gift Ideas for Work**  
by John Bisset 10

**Guy Wire Was Off-Base on EAS**  
by Fred Baumgartner 12

**In Search of Access Equality**  
by Richard E. Butler 14

### GM JOURNAL

**Women: Key in a Tough Economy**  
by Vincent M. Ditingo 19

**Hot Formats: News/Talk,  
'80s, Christian**  
by Ken R. 19

**Plan a Great Sales Campaign**  
by Ken R. 22

**Promo Power: Run Better  
Promotion Meetings**  
by Mark Lapidus 24

### STUDIO SESSIONS

**He Studies Folk to Make Great Spots**  
by Ken R. 31

**Pulling Gear for ATR  
Successor: RVR 1170**  
by Alan R. Peterson 31

**Processor Right for Voice, Music**  
by Ty Ford 34

### BUYER'S GUIDE

**PSI Delivers Town and Country**  
by Richard Potkya 37

**Superior Coverage From Nicom**  
by Jim Turvaville 37

**CFA Holds Promise for AM**  
by Robert E. Richer 38

**OPINION** 54

## More Setbacks for CFA, EH Antennas

Progress is slow for testing of two new antenna designs that have sparked interest — and skepticism — among AM station managers and engineers.

Tests on the CFA antenna, conducted by its proponents, had not begun by mid-November. Original plans had called for completion of those tests by early summer of 2001.

Meanwhile, the EH antenna underwent a first round of tests in October by its proponents. Those tests indicated that the initial EH design for the broadcast band is not an efficient radiator.

Tests on an EH antenna and compared to a standard broadcast antenna at radio station WKVQ(AM), Eatonton, Ga., indicated that the first EH antenna designed for the AM band suffers from poor efficiency.

### December CFA tests?

"The mistake was due to the use of a network developed for the HF version of the EH Antenna (a dipole), which has a high radiation resistance and low capacity," stated Ted Hart, CEO of EH Antenna Systems on its Web site.

"The AM broadcast antenna had low radiation resistance and high capacity. Unfortunately, until the test at the station, we had not applied transmitter power, thus the inefficiency was not evident."

Hart posted details about the initial test, conducted in October, on his Web site at [www.eh-antenna.com](http://www.eh-antenna.com)

Hart told Radio World that a new, quarter-scale design was to be completed by the end of November. The design is intended to improve the match between the transmitter and the antenna. The result should be a full-scale antenna on which new tests will be performed.

"We expect ... final field tests in early December," Hart said.

Meanwhile, delays plague the other AM antenna under development, the CFA antenna project in Shropshire in the United Kingdom.

Robert Richer, president of CFA Limited, base in Farmington, Conn., indicated that the initial matching of a transmitter provided by NTL has taken longer than expected. The installation crew was still working on the phasing system in late November.

Once that phasing system is complete, the antenna's inventor, Dr. Fathi Kabbary, was expected to travel to the site in

England to perform the final matching adjustments and make the antenna operational. When the complete system is operational, Ben Dawson from Hatfield & Dawson will test the antenna. He originally planned to test it last spring.

CFA Limited hired Dawson as part of a joint project involving consulting engineering firms Hatfield & Dawson and duTreil, Lundin & Rackley, to supervise

facilities. Approximately 48 positions were eliminated, many of those jobs were held by full-time contractors on staff who had installed the computer infrastructure. Mackie employs about 1,600 people.

Mackie reorganized its software development groups and expanded what was being handled in Belgium and Canada, taking some of the load of the Woodinville plant.

A spokesman said the company also streamlined the product management teams. With improved coordination between groups, he said, Mackie hopes to integrate technology developed in one group throughout the company and the other groups.

Two sales positions have been created to strengthen relationships with national Mackie and EAW customers. Sales have been solid and new products are in development, according to the company.

### SBE Disbursing Relief Funds

**INDIANAPOLIS** The SBE collected nearly \$50,000 in the first two months in its relief fund for the families of six broadcast technicians and engineers who died in the World Trade Center attacks.

The organization began to disburse funds to family members and said all of the collected money would be used for that purpose.

To send a donation, make checks payable to: "Ennes Trust" and mail to:

testing of the demonstration CFA in England.

Performance tests on the CFA have been delayed for nearly a year for numerous reasons including illness, bad weather and hoof and mouth disease near the test site. The latest delay is the result of the Sept. 11 terrorist attacks. Kabbary reportedly was unable to fly from Egypt to the U.K. to finish the installation.

The CFA and EH antennas have been the subject of convention presentations and print articles as well as extensive industry debate.

AM owners are interested because both antennas promise higher efficiencies, greatly reduced radio frequency radiation around the antenna and the ability to install antennas on relatively small parcels of land and even building rooftops.

Skeptics in the broadcast engineering community believe neither antenna will be able to radiate efficiently enough to serve as a suitable substitute for the common standard broadcast antenna.

— Ted Nahil

## NEWS WATCH

SBE, 9247 N. Meridian Street, Suite 305, Indianapolis, IN 46260. Attn: Broadcast Engineer Relief Fund.

### NAB Changes Radio Show Dates

**WASHINGTON** NAB has moved back the start date of next year's NAB Radio Show in Seattle, which would have started on the first anniversary of September's terrorist attacks.

The show was to start on Sept. 11, 2002, but now will start the next day and run through Sept. 14.

"Sept. 11 next year will be a day of reflection and remembrance for all Americans and we believe it is important to respect that," said NAB Executive Vice President for Radio John David.

"Also, we expect many radio stations may plan something special to mark this sad anniversary and we want to give station managers and employees the opportunity to be on the job that day," David said.

### DTV Task Force Eyes 'New Realities'

**WASHINGTON** Saying its original deadlines for television stations to convert to digital were unrealistic, the FCC has relaxed some of those expectations.

The commission has pushed back the deadline by which stations must need to replicate their grade B contour areas

with digital signals, and also pushed back the deadline for when stations need to make their digital channel assignment selection. The FCC also will consider granting extensions to the DTV conversion deadlines with proof of financial hardship.

With the changes, the FCC hopes to mitigate the financial burden on stations making the digital conversion by allowing costs to be spread out over time. In turn, commissioners believe that, as more stations make the digital jump, receiver sales will increase and so will consumer acceptance of DTV.

However, "No one should mistake this," said FCC Chairman Michael Powell, as "a light standard."

The changes stem in part from recommendations made by a new FCC DTV Task Force.

Powell said, "The DTV transition is a massive and complex undertaking. Although I'm often asked what the FCC is going to do to 'fix' the DTV transition, I believe that a big part of the problem were the unrealistic expectations set by the 2006 target date for return of the analog spectrum. This task force will help us re-examine the assumptions on which the commission based its DTV policies, and give us the ability to react and make necessary adjustments."

Powell said the commission must review the DTV transition in light of "new realities" since the terrorist attacks, including the financial impact on media companies and the impact on consumer spending.

— Leslie Stimson

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# How Many Owners Are Too Few?

Bits, bytes and blips from around the world of radio ...

Will radio consolidate further in years to come? I think so.

The pendulum of regulation and deregulation in media never stops swinging, driven by insatiable market forces; but it's not a balanced, even swing. The overall trend is toward easement.

The time may not be now; it might not be soon; but don't be surprised if someday the powers in Washington lift ownership caps further under pressure from media owners.

"How much more can we possibly consolidate?" some people might ask. My answer: plenty. Although we've seen a drop in the total number of radio owners by about 25 percent since the Telecom Act of 1996, there are many, many owners out there. And as long as most major markets have at least two big competing radio players, the perception that there is room to consolidate further will linger.

Viacom President Mel Karmazin has been among those pushing for further relaxation, making noise about the eight-station-per-market cap. He has been quoted as saying his company took "extraordinary hits" in covering the events of Sept. 11 and that its costs are escalating.

Market forces being what they are, I look for big radio groups to coalesce around a push for higher market caps in the not-too-distant future.

\*\*\*

If you can have a radio in your shower, why not in your ice cooler?

I love oddball radios like this one. The Coleman Cool Box is an AM/FM radio, CD player and cooler in one case. The ice and audio compartments have separate lids. The unit has two 4-inch speakers, built-in AM and FM antennas and room to store eight CDs and nine cans of cola. Power is supplied by eight C batteries or the supplied AC or 12 VDC adapters.

The Cool Box was available recently

in the Wireless catalog and from several online sources including [www.amtech.com](http://www.amtech.com), with pricing ranging anywhere from \$199 to \$295. Cool tunes not included.



The Coleman Cool Box

\*\*\*

I was disappointed that ARMA dropped its planned regional convention in New England this fall.

The event was victimized in part by cancellations after the events of Sept. 11, but also by a general lack of enthusiasm among vendors.

Since Vince Fiola of Studio Technology took over the lead in organizing ARMA events, the group has attempted to stage useful regional trade shows for people who can't attend bigger conventions for reasons of time or cost.

But to succeed, a regional event needs at least 15 or 20 exhibitors, preferably 30 or more. Fiola would have lost about \$10,000 of his company's money if the show had gone forward.

ARMA — the American Radio Manufacturers Association — originally was established by several radio equipment suppliers who felt they lacked an effective voice in the industry and, if truth be told, also wanted to dig the NAB

in the ribs a bit. A trade show was just one of its ambitious goals.

When the founders lost interest or moved on, Fiola helped narrow its focus, making ARMA a less-confrontational organization focused primarily on regional shows to bring vendors and buyers together.

I give him a great deal of credit for trying to make ARMA work. But it is unclear whether there is room or demand in radio for an organization that holds regional conventions, beyond the ones already extant.

Fiola still hopes to hold an ARMA event for next year in the middle Atlantic area.

\*\*\*

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## From the Editor



Paul J. McLane

own. Long before anyone had thought of an online chat room, John was creating this industry forum in which engineers could trade ideas.

I'm writing this because sometimes we forget to appreciate the good stuff that goes on around us all the time.

The other day I clicked on the *Workbench* tab at our Web site, [www.rwonline.com](http://www.rwonline.com). There, quietly available to anyone in the industry, are more than 30 past *Workbench* columns — more than 30,000 words' worth of great ideas, money-saving tips and suggestions to get more out of your job, your RF plant, your radio lifestyle.

Thanks, John, for your great work over the years. 🌐



Happy holidays are in order for Robert D. McCubbins, program director at WCVK(FM) in Bowling Green, Ky. He wins a MAX-Wall 831 Modular Acoustical Environment Kit from Auralex Acoustics in Radio World's Silver Sweepstakes.

The MAX-Wall 831 provides acoustical absorption in mobile and temporary situations, to reduce echo and reverberation. It is modular and expands to fit a number of environments, allowing various configurations. It's available in charcoal gray, purple and burgundy. List price is \$1,299. See [www.auralex.com](http://www.auralex.com) for info on the MAX-Wall.



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## DIGITAL NEWS

## GM Offers DAB In U.S., Canada

**HAMTRAMCK, Mich.** XM investor General Motors has begun offering XM radios as options in two Cadillac models, the 2002 DeVille and Seville.

GM plans to expand availability to 20 models in 2003. Customers who lease or finance through GMAC can roll the XM radio subscription and equipment costs into their monthly car payments.



Photo by Leslie Simson

XM's OEM Marketing Manager Bryan Cantio demos a Delphi-Delco head unit in a 2002 Cadillac DeVille. The unit lists at \$295, including antenna and installation.

Meanwhile, GM of Canada Ltd. plans to offer AM/FM/DAB original equipment radios in its Chevrolet Impalas and Monte Carlos by the end of 2002.

Canada is using the Eureka-147 form of DAB. Approximately 55 DAB stations have made service available to 10 million potential listeners in Vancouver, Toronto, Windsor and Montreal. Ottawa is next in line to be added to the market list, with preparations underway for an airdate of early 2002.

## RadioShack Canada Goes for Eureka

RadioShack Canada Ltd. intends to carry a line of Eureka-147 DAB products for the home and portable markets, including boomboxes, portable devices and DAB computer attachments. Introduction is scheduled for early 2002.

This is the culmination of discussions between RadioShack Canada and Digital Radio Roll-Out Inc.

DRRI is a non-profit initiative of major private and small broadcasters and public broadcasters with the support of the Canadian government.

## Spain Sees 2002 DAB Launch

**MADRID, Spain** Operators who secured DAB licenses here are scheduled to begin operations by mid-2002.

Two licensees plan to be among the first on air by June.

The Ministry of Science and Technology is promoting digital broadcasting to the public as a means of boosting the reach of information technology services across Spain, particularly the use of DAB and DVB as an Internet access platform.

According to a ministry spokesperson, development of this capability "will make Spain, along with Sweden and the United Kingdom, a European leader in the field."

Officials hope that DAB will help improve spectrum resources, increase the number of broadcast operations on the air and increase business opportunities.

The Spanish government plans to use its turn in the European Union's presidency to promote digital broadcasting throughout the union.

— John F. Mason

## Kenwood, Ibiqity Score Licensing Deal

Kenwood Corp. has licensed Ibiqity Digital Corp.'s in-band, on-channel digital broadcast technology.

Kenwood will integrate Ibiqity IBOC chipsets into a line of digital aftermarket mobile and home receivers scheduled for launch at the Consumer Electronics Show in 2003.

"They were the first receiver manufacturer to join our coalition to make digital radio a reality in early 1999, and we are extremely pleased to announce their commitment to license our technology for radios to be sold in 2003," said Robert Struble, president and chief executive officer, Ibiqity Digital Corp.

# Orban/CRL Looks Ahead Cautiously

## Processor Manufacturer Restructures Its Debt, Announces Layoffs, Plans New Products

by Randy J. Stine

**SAN LEANDRO, Calif.** Efforts to streamline costs continue at one of the broadcast industry's more prominent equipment manufacturers.

Circuit Research Labs Inc. has implemented layoffs at its Orban facility in San Leandro, Calif. The company is among several in the industry to announce cutbacks or management changes recently.

CRL also continues to work toward paying off its debt related to the acquisition of Orban Inc.

### Good financial health

A company official said Orban/CRL remains in "good financial health" despite cutting 10 positions in September. The job cuts represent about 15 percent of Orban's workforce.

Orban/CRL Vice President and Chief Operating Officer Jim Seemiller has left the company. He joined shortly after CRL closed on its purchase of Orban in June 2000. He resigned in October. Seemiller owns ATB Broadcasting Corp., a labor management consulting company.

Circuit Research Labs Inc. reached agreement with Harman International Industries Inc. in September to restructure Orban/CRL's debt obligations. CRL paid Harman \$10.5 million for Orban. As a result, CRL has amassed debt of \$8.5 million, according to filings with the Securities and Exchange Commission.

### Notes converted

The publicly traded company has delayed making payments toward the principal on \$3.5 million in short-term debt and \$5 million in long-term debt owed to Harman.

The latest restructuring stipulates that the short-term note be paid on April 30, 2002, along with a \$1.25 million payment toward the long-term note. As a condition of the latest moves, the promissory notes were converted to demand notes payable on the demand of Harman.

CRL President and CEO Jay Brentlinger said the Orban employees were released from their jobs because of economic considerations in the marketplace.

"The financial condition of the  
See ORBAN, page 7 ▶

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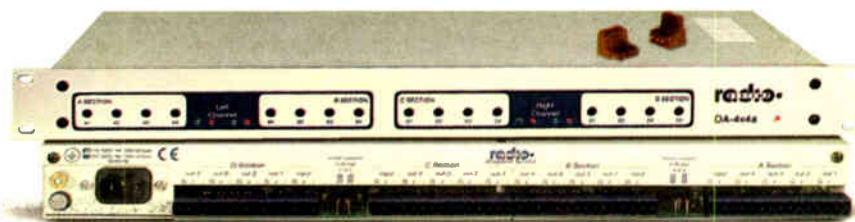
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# NRSC

► Continued from page 1

development, the NRSC now states definitively that IBOC has significantly enhanced performance over analog.

"A lot of the data is quantifiable. We have analog data and new digital data that can be compared handily," said NRSC DAB Subcommittee Chairman Milford Smith.

"The whole goal is to come up with something that's better than what we've got. This is a remarkably robust system that provides a lot of advantages for the listener."

## 'Efficient transition'

By approving the system, the committee states, the FCC would be "charting the course for an efficient transition to digital broadcasting with minimal impact on existing analog FM operation and no new spectrum requirements."

Ibiquity President Robert Struble called the report a validation of Ibiquity's FM system. He hoped the commission would soon put the report out on Public Notice and seek public comment.

NAB President and CEO Eddie Fritts said the endorsement is "a key step in moving broadcasters into the digital era."

Unclear immediately after the NRSC action was what the FCC would do with the report. Several sources believed the commission would seek public comment on the document as a first step, then perhaps ask the NRSC to begin a formal standards-setting process. The commission easily could craft a blanket authorization for stations to implement IBOC, sources said.

Any of these scenarios would fit with Ibiquity's goal of having transmitter partners Harris, Broadcast Electronics and Nautel show IBOC-compatible excitors and transmitters at NAB2002 in the spring.

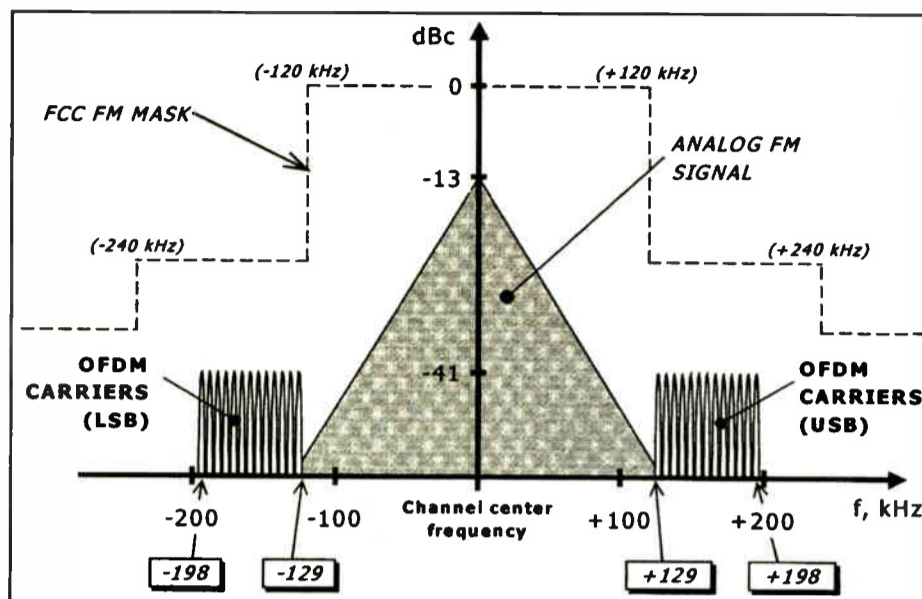
However positive the NRSC is on IBOC, members were careful to say there will be tradeoffs in terms of compatibility between the digital signal and its impact on adjacent channels.

In the Ibiquity system, the digital sidebands of the host station sit in the first adjacent channel of the next station. The amount of digital energy

being transmitted is relatively low, around 23 dB, but Ibiquity told the NRSC when it submitted its test results that field test results indicate there could be some impact on analog first-adjacents (RW, Sept. 12.)

Smith and NAB Science and Technology Vice President John

ence. This characteristic of mobile receivers will also tend to mask any IBOC-related noise. The validity and effectiveness of these masking mechanisms is apparent from the rigorous subjective evaluations performed on the data obtained during the NRSC's adjacent-channel testing."



The Ibiquity FM IBOC system supports transmission of digital audio and auxiliary digital data within an existing FM channel allocation by placing two groups of digitally modulated carrier signals adjacent to an analog FM signal. Source: NRSC

Marino said the NRSC believes the tradeoffs are modest and acceptable.

"Some of the earlier versions of IBOC systems were horrific in terms of compatibility," said one source.

In its report, the NRSC wrote this about the implementation tradeoffs:

"With respect to the main channel audio signal, evaluation of test data shows that a small decrease in audio signal-to-noise ratio will be evident to some listeners in localized areas where first-adjacent stations, operating with the FM IBOC system, overlap the coverage of a desired station.

"However," the committee continued, "listeners in these particular areas may also be subject to adjacent channel *analog* interference, which will tend to mask the IBOC-related interference, most appropriately characterized as band-limited 'white' noise, rendering it inaudible under normal listening conditions.

"Also, all present-day mobile receivers include a stereo blend-to-mono function dynamically active under conditions of varying signal strength and adjacent channel interfer-

ence. The committee provided further findings about the impact on non-host analog signals:

"Co-channel interference: no impact on analog reception.

"First-adjacent channel interference: listeners within the protected contour should not perceive an impact, but a limited number of listeners may perceive an impact outside of the protected contour under certain conditions.

"Second-adjacent channel interference: NRSC tests indicated that some receivers (with performance similar to the NRSC analog automotive and portable receivers) should not experience an impact on performance due to second-adjacent channel hybrid FM IBOC interference, however a very limited number of receivers (with performance similar to the home hi-fi receiver used in the NRSC tests) might experience a negative impact for -30 to -40 dB (and more negative) D/U ratios."

Listeners should not perceive an impact on analog host station reception in the FM hybrid mode, the NRSC states in its report.

The NRSC has yet to evaluate the system for unimpaired audio quality; it will do so when Ibiquity delivers more test results after integrating its Perceptual Audio Coding algorithm rather than MPEG-2 AAC, its former audio codec.

Questions remain about the system's effect on analog FM subcarriers. Receiver results varied widely, sources said.

As a result, Ibiquity, National Public Radio and the International Association of Audio Information Services have agreed to perform additional tests to determine how certain SCA receivers will perform after IBOC is implemented on host and adjacent channel stations. Results would be given to the FCC directly, sources said.

## Criteria

Smith said this latest effort to evaluate IBOC was the most comprehensive so far, from the sheer amount of data the group studied.

The evaluation working group, a subset of the DAB Subcommittee, reviewed lab and field test results of Ibiquity Digital Corp.'s FM IBOC in eight performance areas: audio quality, service area, durability, acquisition performance, auxiliary data capacity, behavior as signal degrades, stereo separation, flexibility and the IBOC signal's impact on the host and neighboring stations.

The report is the result of efforts from several volunteers, led by Dr. Don Messer of the International Broadcasting Bureau.

The NRSC hoped to begin evaluating Ibiquity's AM system at its next meeting in mid-December. It hopes to have that report completed by early March.

Also in November, the International Telecommunication Union initially endorsed Ibiquity's FM system for use abroad and intended to put a draft recommendation for a vote before its 189-country membership.

In April, the ITU had endorsed Ibiquity's AM system (below 30 MHz) for use in other countries along with the Digital Radio Mondiale AM system for long-wave, medium-wave and shortwave use.

The full NRSC report is available on its portion of NAB's Web site, at [www.nab.org/SciTech/Fmevalreportfinal.pdf](http://www.nab.org/SciTech/Fmevalreportfinal.pdf).

## Public Service Announcement

The BlueBox is a new POTS codec from Comrex. This codec delivers the audio quality of our Matrix and Vector codecs (15 kHz on a standard dial-up line) at the entry-level price of our HotLine, just \$2800. It also adds features such as wireless operation, field upgradability, and a cellular hands-free interface, and remains completely compatible with all our POTS codecs.

Since the HotLine is so popular, we decided to provide a "heads up" in advance of replacing it. To this end:

- 1) The BlueBox will begin shipping in February 2002, and the HotLine will be taken out of production.
- 2) We'll continue to support the HotLine for many years to come.
- 3) If you can't wait for the BlueBox, you can buy our remaining HotLines at the new price of \$1995 (while supplies last!)

We at Comrex hope this helps. If you want to talk about the options or try a demo of any of the Comrex codecs, give us a call at 800-237-1776.

If you want a small 15 kHz POTS codec that can also work on wireless circuits but only want to pay \$2800, you can wait and buy the BlueBox in February.



Choice A  
The BlueBox: \$2800

Choice B  
The HotLine:  
\$1995



If you need a POTS codec today, if 7 kHz is more than enough, or if you just want to save money, you can purchase the HotLine for \$1995. But don't delay, there is limited stock available.

# Orban

► Continued from page 5  
company is very good," Brentlinger said. "We are restructuring the company and making ourselves leaner. When you have a drop in orders, that's when you have manufacturing layoffs."

Brentlinger said layoffs would not have been necessary had it not been for the events of Sept. 11.

"Bookings, sales and shipments have been off since the disaster," Brentlinger said. "But we are already seeing good reports from our dealers that indicate sales may pick back up soon. I wouldn't rule out re-hiring some of the people we had to lay off."

Brentlinger said CRL is in the "building cash, not spending cash" mode with the current U.S. economic slowdown.

"We're keeping the company healthy, efficient and profitable. That is our No. 1 goal and Harman's too. This is not the time to worry over principal reduction," he said.

## Other layoffs

Other suppliers in the broadcast industry have announced changes or cutbacks in recent weeks. Harris Corp. scaled back its Pacific operation in Carlsbad, Calif., laying off approximately 50 employees and transferring 10 others. Klotz Digital shuffled its operation in Atlanta and named a new president. Mackie cut 48 jobs.

According to filings with the SEC in September, Orban/CRL officials have concerns over the ability to raise the additional funding needed to satisfy the debt. In a registration statement, officials wrote, "We will need additional debt or equity to service the debt payable as a result of our acquisition of Orban, and we may not be able to obtain this financing on acceptable terms."

Brentlinger said it is not unusual for prospectus filings to contain such warnings. The new registration allows Orban/CRL to raise capital through the sale of stock and warrants. Harman has warrants to purchase 1 million shares of CRL's common stock, Brentlinger said.

"When we acquired Orban, we did a private placement. ... Those shareholders had unregistered securities. This is their opportunity to exercise

warrants attached to those shares," he said.

Industry analysts said Harman appears to be flexible and willing to remain patient to see the sale through. Messages left with Harman officials were not returned.

"Harman has been very much in our court and very supportive of our efforts. We have worked very closely with Harman on this. Obviously we had to work very closely with them to buy (Orban)," Brentlinger said.

Orban/CRL reported earnings of \$842,304, or 9 cents per share, and net income of \$212,031 for the second quarter ending June 30. The company's gross sales through the first six months of 2001 were \$9.6 million. Third-quarter earnings were due to be released in late November.

Brentlinger said the company's financial circumstances have had no impact upon new product development.

Orban is known in the industry for its Optimod processor lineup, its digital workstations and the contributions of co-founder Bob Orban, who remains on its staff.

## New FM processor

The company plans to unveil a new FM processor at NAB2002 in April in Las Vegas.

"You can never mess with R&D. That is the future of any company," Brentlinger said.

The combined CRL and Orban operation now has 75 employees, Brentlinger said. He expects some further consolidation of operations between CRL's headquarters in

Tempe, Ariz., and Orban's San Leandro facility. Sales, marketing and purchasing would be the likely areas affected, he said.

Kerrell Paige, former marketing manager for advertising at Orban/CRL, was among those laid off in September.

Paige said job cuts came from sales, marketing, CAD and manufacturing. She said subsequent resignations have occurred since the layoffs were announced.

Circuit Research Labs Inc. common stock is publicly traded on the OTC Bulletin Board (NASDAQ:CRLI). CRL stock has declined since its purchase of Orban.

At nearly \$12 a share in August of 2000, the stock closed at 80 cents a share on Nov. 28. ●

## What do you get when you cross a Matrix with a HotLine?



**The BlueBox:**  
The audio quality of the Matrix at a fraction of the price.



**Order yours today!**

15 kHz on a single POTS (Plain Old Telephone Service) line for **\$2800!**

Want to save even more \$\$\$? Buy a HotLine for just \$1995 while they last!

## Please note

The *Matrix* with its modular design is available if you want the ultimate in flexibility and future-proof ability.

If you need the convenience of an integrated 4-channel mixer, the *Vector* is available.

The *Matrix Rackmount* is an appropriate studio version for any of these portable codecs.



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# How to Fight Sags and Surges

*Tips to Help You Get the Most Out of Power Protection for Your Radio Station*

by Tom Vernon

It's a dirty, polluted world out there, and it's not getting any better.

That sentiment can also be applied to the AC power feed for your station. RFI/EMI, sags, surges, spikes, brownouts and blackouts all can conspire to wreak havoc on your studio gear, computers and transmitting equipment.

There's a dizzying array of products out there that help with power conditioning: uninterruptible power supplies, surge suppressors, balanced AC transformers, generators and voltage regulators.

Here are some guidelines to help decide what goes where.

Mention surge suppressors and most people think of the AC strips gathering dust behind computers. Those strips are known

as shunt mode protectors, because they contain metal oxide varistors, or MOVs, that theoretically shunt surges to ground.

As Andrew Benton, director of engineering for Surgex, puts it, some better alternatives exist to protect sensitive equipment.

"There are two problems with most AC strips. First, the MOVs inside can degrade with use, to the point that they're ineffective, and equipment attached to the strip is unprotected. Second, when they do work, they shunt the energy from the surge into the ground and neutral wires, and this can do more harm than good.

"Series mode surge protection, on the other hand, works by creating a low-pass filter that blocks the majority of the high-frequency energy that makes up most surges, yet still passes realistic 60 Hz load currents of 15 to 20 A."

Any unprotected computers or studio gear should be protected by a small surge suppressor. A line-interactive or online UPS usually will do a good job of protecting the equipment attached to it, but the UPS itself is often vulnerable to damage by surges. A good plan, according to Benton, is to install a series mode surge protector ahead of the UPS.

In order to make intelligent purchases of surge protection equipment, consumers

See POWER, page 16 ▶



This publicity shot for Cummins reminds clients how much they have at stake should the power go off.



Learn to differentiate between types of UPS, like this one from MGE UPS Systems.

## MARKET PLACE

### CartWorks Expands Lineup

CartWorks/dbm Systems Inc. has added several items to its lineup.

Support for the Cart Chunk Standard allows standard interchange formats among manufacturers of various digital audio systems. Cart Chunk is a non-proprietary standard that allows additional text data like title, artist and run dates to be included in a WAV file.

Effective with version 14.0, audio files recorded with CartWorks systems contain the standard Cart Chunk. When importing audio files recorded on other systems, CartWorks reads their Cart Chunk data if available.

Also new is a Web Update site content generator that includes text and graphics. CartWorks Music-on-Hard-Drive systems can generate live content for a Web site automatically. This allows a site to display song titles and artist names in context with what's playing on air. Links can be added for sources of artist bios to

make a site more interactive. Photos and graphics may be displayed in context; you can show a client's logo while his spot is playing.

Ad insertion is also on tap at dbm. The company has developed a communications protocol that allows CartWorks to signal a streaming host to insert Internet-only commercials. Development is almost complete on a local solution that allows a broadcaster to keep the revenue. A single CartWorks system can automatically insert and play Internet spots where needed.

For information contact the company in Mississippi at (800) 795-RADIO or (601) 856-9080 or visit [www.cartworks.com](http://www.cartworks.com).



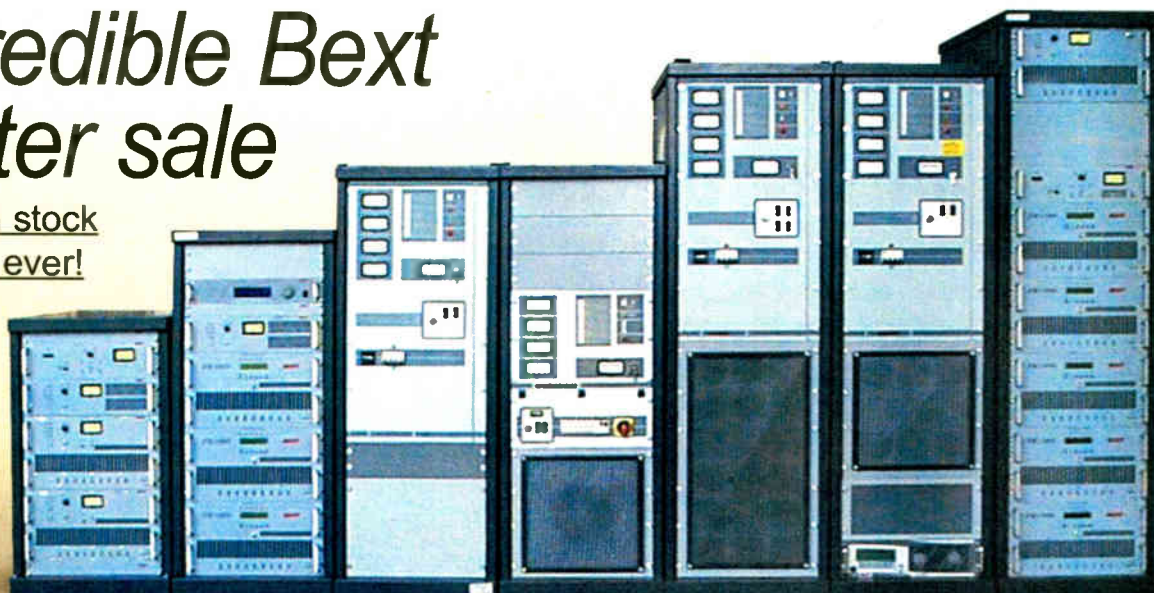
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## MILLION DOLLAR SOUND FOR UNDER \$4,000\*

Introducing Omnia-3, the all-digital audio processor that offers all the clarity, punch and raw power of the original Omnia. At an amazingly affordable price.

Omnia-3 includes standard features not found anywhere else—like 48kHz sampling, three-band processing, digital audio inputs and outputs, integrated composite clipper, and a removable PC card that simplifies software changes.

Impressive features aside, it's the sound that will blow you away. No other audio processor sounds as good as Omnia. That's why leading broadcasters the world over choose Omnia to boost ratings and crush the competition.

For this much power—on the dial and in the marketplace—you'd expect to pay twice the price. But now, you don't have to.

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Omnia is used in 4 of 5 leading stations in New York, 2 of the 3 top stations in Los Angeles and 5 of 6 of the most listened to stations in the US. It's on the leading stations in Paris, all of the BBC's FM stations in the UK, and the number one stations in Canada, Ireland, Germany, Finland, Australia, India, China, Denmark, and Sweden.

\*\$3,980 (US) MSRP for Omnia-3fn model. Prices may be slightly higher outside the U.S. due to duties, freight and other costs.

# Workbench

Radio World, December 19, 2001

Past columns are archived at [www.rwonline.com/reference-room](http://www.rwonline.com/reference-room)

## Last-Minute Gift Ideas for Work

by John Bisset

Here's a column you'll want to cut out and give to your friends and family as they wrap up their holiday shopping. Maybe they'll take the hint!

We've talked about the benefits of infra-red inspections. Mike Gilbert, chief at Multicultural's KARI(AM) in Blaine, Wash., picked up a portable Wahl infrared temperature monitor.

This hand-held device, pictured in

temperature of elbows or coax junctions can spot internal problems, without using Superman's X-ray vision.

Comparing the surface temperature of several elbows can give you a base-line number for normal operation. Periodic measurements will ensure your system is running properly.

Home Depot or similar large-scale hardware stores will stock items like the Wahl temperature monitor or the Plano cases and satchel.

Plan to spend a little time when you visit these stores; they are chock-full of engineering goodies at reasonable prices.



Fig. 2: Plano makes a mini satchel that fits neatly behind your driver's seat.

Looking for several useful add-ons for your remote control? Consider the Burk Temperature Module and Sensor. The device will accept up to four temperature probes (one is included with the module).

If you have air-pressurized transmission

See WORKBENCH, page 12 ▶



Fig. 1: This Clear Channel engineer is well-organized.

Chris Kelly, CE at the Salisbury, Md., Clear Channel cluster, has organized all of his small parts in metal and plastic cases, as seen in Fig. 1.

Heading to the transmitter site, or perhaps a remote site? Take the Plano mini satchel, shown in Fig. 2, which combines several smaller plastic drawers in a canvas case. The mini satchel fits behind your truck seat or in the trunk and can be loaded with a variety of plugs, connectors and lugs. The case lids fit snugly, so even small components won't mix from one compartment to the other.

★★★

Fig. 3, shoots a red beam to allow you to zero in on the part or object you are measuring. An LED display reads the temperature of the device you are measuring.

In the photo, Mike is measuring the temperature of a microprocessor. He has checked every physical connection in the station's phasor and ACUs, as well as AC breaker connections and other electrical junctions.

Are AM RF contactor contacts worn? The temperature monitor will alert you to a build-up of heat, before the contact surface fails, taking you off the air.

In an FM application, measuring the

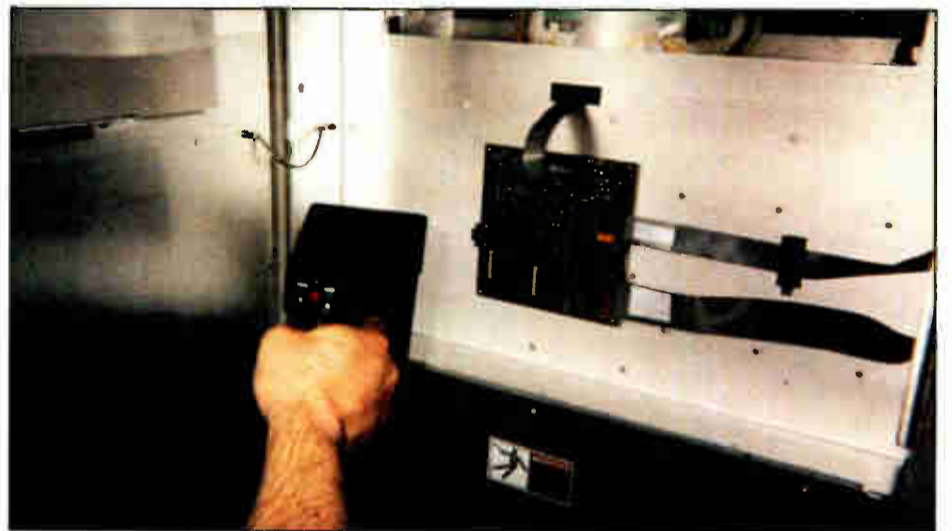


Fig. 3: Wahl's infrared temperature monitor measures a microprocessor.

## Dependable Modulation Monitors for AM & FM

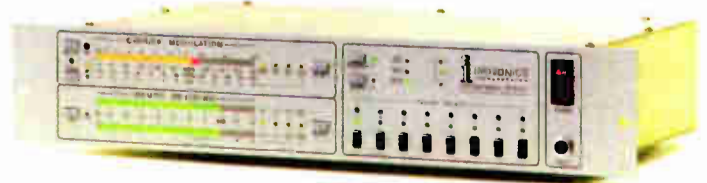
### 520 AM Mod-Monitor

- Built-in, tunable preselector for accurate off-air measurements
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- Companion active antenna option



### 530 FM Mod-Monitor

- Off-air operation with 8 station presets
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## At Ease... with Radio Systems Millenium Consoles

by  
**Grady Moates, owner  
Loud and Clean**

Boston, MA: I'd have to answer the question, "Why have you installed so many Radio Systems consoles?" with the simple phrase, "I'm lazy!" My goal, as a contract engineer, is to specify and install equipment that addresses all the needs of an on-air or basic production studio efficiently and inexpensively, while minimizing my time spent, both during and after installation. The centerpiece of most of my studio designs is a Radio Systems console.

The Radio Systems RS-12 has been the "easiest to install" console I've ever worked with, and the new Millenium series builds on that reputation with unparalleled control surface reliability.

Planning is a breeze, because you can put any combination of input levels anywhere on the console, and you never have to build an attenuation pad. Never. Microphone level inputs, line level inputs, consumer level inputs and even those pesky "lower than consumer but higher than mic level" inputs can all be intermixed on any fader in the console using only gain jumpers and plug-in headers to set levels. Remote control is equally simple because all basic remote control functions are built into every fader, with sophisticated programming choices just a jumper plug away.

Building renovation is easy to accommodate as well. I've moved complete studios centered around Radio Systems consoles, breaking them down and rebuilding them in another room with all functions restored, in 6 hours. As a matter of fact, I've done it twice in the last 3 months.

Service is another area where I save time with Radio Systems consoles. I've got full access to everything in the console with a swift lift of the hood. The new Millenium series uses

soft-urethane buttons that press conductive pads directly onto gold-plated contacts on the circuit board, with well-designed seals to prevent moisture and dust from contaminating the contact area. Lamps have been replaced with LEDs, which may need to be replaced someday, but I've never had to replace one. Faders, potentiometers and headphone jacks are just about the only interface components that operators can still kill, and they can be replaced in 5 minutes, with the power on, using only an Allen driver and a nut driver. There are Millenium consoles that were installed 3 years ago that I've not had to touch since installation. Install'em and forget'em, that's what I say.

Millenium consoles offer excellent audio quality. From Classical to Rock to Folk to Blues to Oldies to Talk to Foreign Language, the Millenium console does the job clearly, quietly, consistently, and inexpensively.

There's one other reason for specifying Radio Systems consoles, and that's customer satisfaction after installation. It's reassuring to see customers with one Radio Systems console purchasing a second one. Then a third one. Then a fourth one. In a conversation I had just the other day, Rob Landry, the Chief Engineer for WCRB/World Classical Network, who uses four RS-12's and an RS-18 said to me, "I'm ready to build new studios at one of our other stations, and I can't think of a single reason to buy anything other than Radio Systems."

I guess he's lazy too.



**Disaster Relief**  
From now until the end of the year, Radio Systems will donate \$100 for every console sold to the American Liberty Partnership.

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## GUEST COMMENTARY

# Guy Wire Was Off-Base on EAS

by Fred Baumgartner

"Guy Wire, you ignorant putz ..."

Reading your critique of the Emergency Alert System in the Nov. 7 issue of Radio World was more entertaining than watching a free-range pig select dessert in a French bakery — and the opinions expressed of similar value.

Guy, you don't use that soldering

gun on surface-mount printed circuit boards, do you?

Of course, I know you're doing the *talk-radio-tease-em-into-calling* thing. So, here's a call-in, all jabs in good fun aside.

On Sept. 11, it wasn't EAS that failed to work. The authorities failed to activate it. Now on this point, your and my opinions differ.

I can understand why they didn't.

The appropriate message might have been to evacuate 14th Street south. I think by the time any authority knew that, the point was moot. Kicking the transmitter because the jock blipped is poor engineering and poor analysis, but may be good therapy. Kicking EAS may be similarly curative.

On the subject of the weakest link being disc jockeys: Duh. That's why you don't see them on TV shows.

But you missed the irony. The EAS was designed to be and can be run automatically, and originally that was the *only* mode proposed. A lot of that had to do with reducing the warning propagation delay to something less than the lifespan of a tornado (in EBS, the delay averaged 12 minutes and the average tornado lasted 10). It was the broadcasters who wanted their disc jockeys to exercise that control on *their* stations, hence the manual modes.

**EAS works best when local energy is focused on those local trust relationships — broadcasters and authorities working together.**

One might question the wisdom of delaying an emergency message so that a jock can second-guess the mayor, but that's another column, I'm sure. It was always a trust and control issue.

You did get two things right. First, the EAS is too complicated. To make a long story short, the feature creep, the many required tests, printers and all that came about as a result of the adoption process.

The voices were from FEMA and the FCC and the competing vendors. None of these folks were overly motivated to make it simple and effective or to push costs down.

So as you represent engineers and broadcasters, recall that the industry (the SBE and NAB) failed to make any move to participate in the process or to propose a system that met the broadcasters' agenda. So oddly enough we got a system that fit someone else's desires.

Sometimes the enemy is us, and we

See EAS, page 17 ▶

## Workbench

▶ Continued from page 10

line, the Phartronics Temperature Sensor Interface is a must. This module provides a linear DC voltage proportional to the gas pressure, and can be easily T'd into your existing line, as shown in Fig. 4.

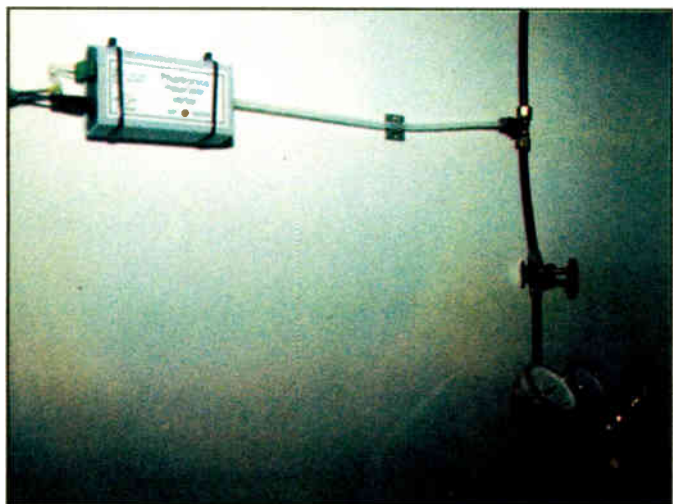


Fig. 4: Phartronics Temperature Sensor Interface

★ ★ ★

Phone accessories make good gifts.

Around the transmitter building, a long telephone cord, one that will reach to the transmitter should you need to talk to the factory to troubleshoot a problem, is helpful. A spare telephone cord is a good idea; they do get frayed.

Does your telephone have a mute switch? Consider

installing one, because it will block background noise as you discuss your problem with a factory technician.

If you have a traditional telephone, find one of those "confidencer" noise-canceling handset mikes. It drops into the handset, and dramatically reduces background noise as you talk. Check the next Hamfest for one of these.

Speaking of telephones, how about adding call-waiting on the transmitter phone line? If you're on the phone and that service technician is trying to reach you, you won't miss the call.

I've spoken to some engineers who have used cordless phones, but many are plagued with RFI, so choose wisely. Another consideration is the cordless battery. A phone left in place with a constant trickle charge will eventually kill the battery. Better plan on a spare battery, just to be sure.

Glenn Foldessy of WOAC(TV), Channel 67 in Canton, Ohio, uses a \$100 V-Tek cordless phone with great success. Try Model VT-9000, a 900 MHz phone that works great, even in front of 104 kW of 789.25 MHz visual power.

Glenn has used this cordless phone at many of his clients' AM and FM sites. He can describe a part or problem accurately without having to write it down — a real timesaver.

★ ★ ★

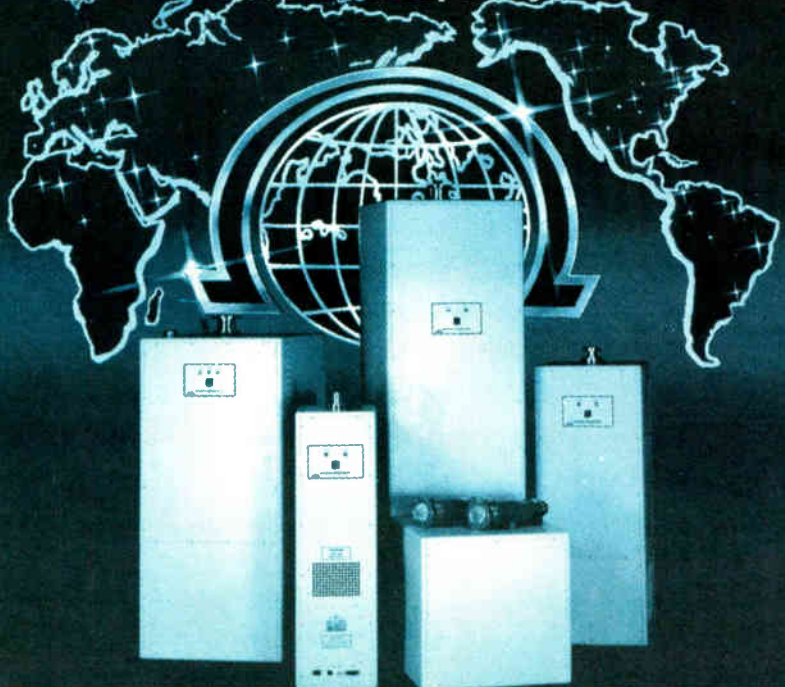
With winter upon us, make sure your transmitter site has a shovel, some bottled water, some chocolate or protein bars, and a can or two of canned spaghetti or even a couple of jars of baby food on the shelf — just in case you get stranded.

*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 send e-mail to [jbisset@harris.com](mailto:jbisset@harris.com).*

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## Rave Reviews!

"Excellent Product" — Doug Walker, Clear Channel, Cincinnati

"Telos has taken two great products [the Zephyr and the Zephyr Express] and made them better. They listened to the customer." — Raul Velez KNBR, KFOG, Susquehanna Broadcasting of San Francisco

"Telos asked us what we wanted and they put it in there... you can't ask for anything more than that."  
— Paul Burt, Clear Channel, New Orleans

"It's even easier to use than the original Zephyr."  
— Michael Black, WEOS, Geneva, New York (NPR affiliate station)

"The most popular ISDN digital transceiver in the country has a fresh new look... Zephyr Xstream, a slick, updated version of [the] familiar Zephyr."  
— Steve Kirsch, Silver Lake Audio, New York

*Telos*  
www.zephyr.com



## GUEST COMMENTARY

# In Search of Access Equality

by Richard E. Butler

In the April 11 issue of Radio World, I read the guest commentary "It's Radio, Jim, But Not as We Know It" by Quentin Howard, which provided some interesting generic insights but fell away on some critical elements.

We all know a major factor in the success of DAB will be the achievement of effective cost reductions in digital receivers and terminals. So with the years of availability of the Eureka-147 specifications, it must be disappointing that the mass production encouraged by your guest commentator has not come about.

## System development

The sentiments can be appreciated for I am well aware of the huge efforts that have gone into its development as a specification standard over the past decade or more.

But it is the gratuitous advice that has been given to countries like Australia — "DRM would be ideal for the Outback and Eureka for its metropolitan cities" — that needs correction.

First, such a suggestion flies in the face of a long-standing objective of the search for technologies to enable the prospect of universal service throughout the nation — this means to Australians living on the continent and also the associated Australian small islands.

In the current era of human, economic, political and related rights, many governments are required to address the reach of new technologies and services to the underserved rural and remote areas of their countries.

Shortfalls of the past, taken for granted on economic considerations, are no longer valid for satisfying the

aspirations of those rural and remote communities for whom quality radio and associated services are a vital yearning and need.

What is at issue now is the strength of national values and the search for solutions to provide reasonable equality of access.

Indeed, in regards to Australia, there is a parliamentary inquiry into the radio industry over services to the non-metropolitan areas.

As to Digital Radio Mondiale (DRM) technology developments, there must be major policy, budgetary and operational cost issues related to available HF spectrum and parallel

age, as follows: A, Australia and its small islands, Papua New Guinea and East Timor; B, the South Pacific; and C, parts of Asia (mainly the ASEAN area).

The common user-sharing opportunities of a satellite capability for direct DAB transmission to personal and portable receivers may well enable a mix of complementary, low-cost terrestrial single-frequency networking.

## Efficiencies

At the same time, it may well provide both efficient spectrum use and the business case to widen service

**Dick Butler, the chairman of AsiaSpace and former secretary general of the ITU, comments here on the direction of global digital services.**

running, having moved off the earlier intended change to single sideband, which could have been accommodated with somewhat easier transition arrangements.

## Complementary mix

In 1993, following WARC 92, Australia notified the ITU of a proposed L-band DAB satellite system at 151.5 degrees east with particular spot beams within the nation.

But in 1999, the notification was modified to provide for a potential system of three independent sub-regional beams, each with prime cover-

age beyond the simple and expensive terrestrial solutions that have been advocated by particular interests.

But there are other changes toward enhancing specifications and low-cost service opportunities.

For example, the initial WorldSpace satellite delivery specifications (system D) have now been extended. International recognition has been given in the ITU-R process, to provide for spatial diversity (repeated "second" with a slightly delayed signal transmission) and now a modern MCM application for low-powered retransmission — now known as a hybrid satellite/terrestrial standard.

These enhancements will go into the commercialization phase in 2002.

They will facilitate service where line-of-sight may be hindered — in tunnels, under bridges and in built-up areas.

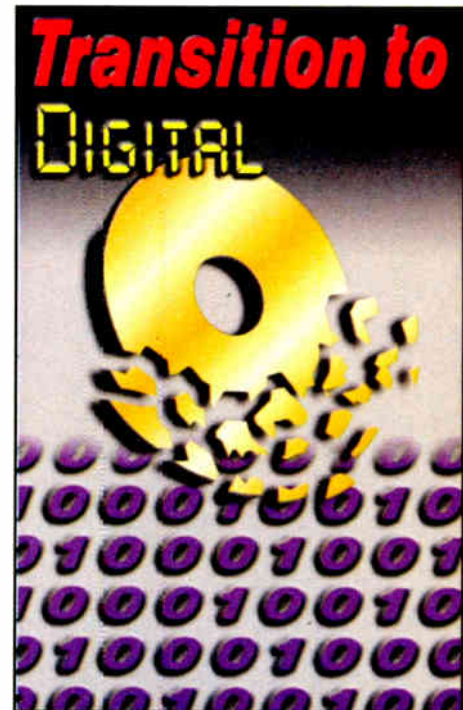
In reality, this development fits well with the intention of WARC 92 for spectrum allocation for BSS (satellite radio broadcasting and complementary terrestrial coverage).

Now let us turn to the vital question of receiver price reductions. The initial WorldSpace receivers of three years back may have come to market in the \$200 to \$300 range, but this has already been halved for the receivers of the original four manufacturers from Japan.

Moreover, other manufacturers are now active in China, India, Indonesia, Korea and Thailand with major price downturns to below \$100.

One unit going into mass production is expected to come to market for \$60, with basic features of addressability, connection to other multimedia products and desktop computers.

In another instance, there is the low-cost addition of the L-band DAB service feature to a CD multiplayer unit at minimum cost to the market, which has led to action toward the



export of the product to other countries — developed and developing.

You will note the accent on service delivery, as well as on the comparative indications of unmatched current price levels to other digital systems. As I indicated, there is the evidence for further price reductions sooner rather than later.

Moreover, already in service is multimedia downstream — quality sound with graphics, image and text. This is opening up many support possibilities for agriculture, education, environment, health and tourism, and for small community traders with fixed, portable and mobile access.

## New services

Indeed multimedia and datastreaming services are already in operation through PC card accessories to receivers to desktop computers or direct via accredited versions of yagi antennas with card connector direct to desktop PCs and from both AfriStar and AsiaStar.

In July 2001, WorldSpace and its China joint-venture partner ChinaSat commissioned a new hub uplink earthstation in Beijing for uplinking to the AsiaStar northeast beam deliver DSB services in China and the neighboring areas. China has opted to use the L-band spectrum allocation for satellite DRB.

Action is well in hand for uplinking both quality radio and multimedia information services to the addressable receivers and terminals throughout China.

In summary, the WorldSpace system has been in operation for some three years and has provided quality performance beyond expectations. There has been the international recognition of the extension of the initial satellite delivery specifications for efficient and effective spectrum use with hybrid satellite/terrestrial means of delivery for fixed and mobile applications.

There have been the significant and major reductions in the consumer prices for the personal and portable receivers and terminals. Further downward reductions are in the pipeline.

Richard (Dick) E. Butler is chairman of AsiaSpace and former secretary general of the International Telecommunications Union (ITU).

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# Power

► Continued from page 8

need to understand the two types of Underwriters Laboratories certification: safety testing and endurance testing. UL 1449 is a safety certification that only ensures a unit will not be a fire hazard.

"UL 1449 endurance testing is optional," Benton said. "Manufacturers are not required to submit their products for endurance testing, but those who do can offer the customer a guarantee of performance." For maximum protection, look for equipment UL certified Grade A, Class 1, Mode 1.

Series mode surge protectors are available for a range of loads, with "bricks" to protect smaller items, rack-

mount units to protect an array of studio gear and protectors in NEMA enclosures for larger applications.

An alternative to the installation of surge suppressors to protect gear is the use of balanced power.

## Everything in balance

In addition to protection, balanced AC lines have other advantages, most notably a reduction of noise levels in both analog and digital audio gear. These advantages add to the bottom line. Protecting equipment with a balanced power system typically costs more than installation of surge suppressors.

Rick Henry, marketing and sales director for Equi=Tech, feels that balanced power has raised the standards in both the recording and broadcast industries.

"When digital went to 24/96 resolution, what were once grains of sand are now



Superior Electric makes a popular line of voltage regulators.

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# Logitek

boulders. Using balanced AC with power amps gives a much tighter bottom end, better imaging from left to right, and more detail on the high end."

As balanced power systems have evolved, features have been added for safety and customer convenience. Christos Desalernos, an account executive of Furman Sound, said, "Customers should look for features such as ground fault protection, a soft-start circuit to protect equipment from turn-on transients, regulation of at least plus or minus five volts, and the ability to disconnect from the AC line if voltage drops below 88 volts or above 140 volts."

## UPS and away

The uninterruptible power supply offers a degree of protection from short power outages, and can, in some instances, clean up incoming power. Choosing the right one for an application involves understanding some statistics about power outages as well as the type of equipment that is connected to it.

There are three types of UPS: off-line, line interactive and online.

Off-line, the least expensive, feeds raw AC straight through to equipment, and only switches over to full UPS mode in the event of a power failure.

A line interactive UPS feeds raw power to the device, but if voltage fluctuates, it compensates for those fluctuations, and if the power drops out, it will switch to UPS mode.

The true online UPS is the most expensive, and most suitable for protection of broadcast equipment because it isolates equipment completely from the utility service. Incoming power is converted to DC battery power, which is then converted back to AC and fed to customer equipment.

In addition to isolation from utility line noise, the online UPS has no switching delays because it is running on batteries all the time.

Making cost-effective decisions in the purchase of a UPS involves looking at what type of equipment is connected to a UPS, and how critical it is.

"If all you require is bulk power to take care of office workstations, then the less expensive off-line or line interactive UPSs are fine," said Alan Katz, senior product manager for MGE UPS Systems. "But if you're backing up your studio where you have noise considerations and cannot tolerate interruptions, then an online UPS would be the best choice."

As with audio gear, the harmonic distortion, or THD rating of the UPS is critical. Katz said better units have less than 5 percent THD.

The nature and duration of power

See POWER, page 17 ►



# Power

► Continued from page 16  
disruptions must also be understood.

"About 87 percent of outages are 1-2 seconds in duration, and take the form of surges, spikes and voltage deviations," Katz said. "Only 2 percent of the incidents that affect critical equipment are blackouts. Most customers are well protected with about 20 minutes of battery time."

## Generators

For critical equipment that cannot be off for even that 2 percent of the time, a backup generator or genset is in order.

Energy deregulation has changed some of the ground rules for purchasing and operating a generator. Gary Olson, technical counsel for Cummins, said users of 500 kW and larger generators may have the potential to reduce their electric bill.

"Utilities are often interested in providing reduced rates for broadcasters that will have larger generator sets and be willing to run their loads on generator power during times of peak demand."

protection agencies have exhaust emission limitations, and a permit may be required.

You may also be limited in the number of hours a genset can be run, or be required to install emissions devices."

Olson emphasizes the need to involve utility company representatives and engineers from the manufacturer early in the planning process, as every site and installation is different.

Transmitter sites have their own unique requirements for power conditioning.

The remote locations of many transmitter installations means that the delivered AC often is unstable and below its specified voltage rating.

Ted Gladis, regional sales manager for Superior Electric, said, "In many instances we've seen a drop on 480-volt lines at remote sites of up to 15 percent. Most transmitters are spec'd out with a line voltage tolerance of plus or minus 5 percent. This constant low line voltage can shorten tube life and cause degraded transmitter performance."

In order to maintain stability and correct for a constant low line voltage, a voltage regulator needs to be installed at the transmitter site. There are several types of regu-

## The online UPS has no switching delays because it is running on batteries all the time.

To do this, the generator must be designed to work well in a distributed generation infrastructure.

"A soft transition transfer switch is used," Olson said, "which parallels the generator with the AC utility, and ramps the load from source to source slowly." Under some circumstances, broadcasters can finance the cost of the generator with the savings realized through rate reductions from utility companies. Payback times can be as short as three to four years.

Advance planning is essential before purchasing a generator.

"When the genset is installed, you need to consider issues such as noise and exhaust emission," Olson said. "Sound attenuation may need to be installed, especially in urban areas. Usually state environmental

lators available, but the older ferroresonant and adjustable tap styles aren't used for new installations.

Ferroresonant regulators are sensitive to AC line frequency and generate EMI. Transformers with adjustable taps can continuously switch those tap connections as voltages fluctuate, and wear themselves out quickly.

"Current technology," Gladis said, "is based on variable transformer-based regulators where there is a continuous adjustment with a carbon brush across the commutator surface."

Many voltage regulators have a TVSS option, which is worth considering when planning or upgrading an installation.

In addition to the voltage regulator and generator, the transmitter site probably will

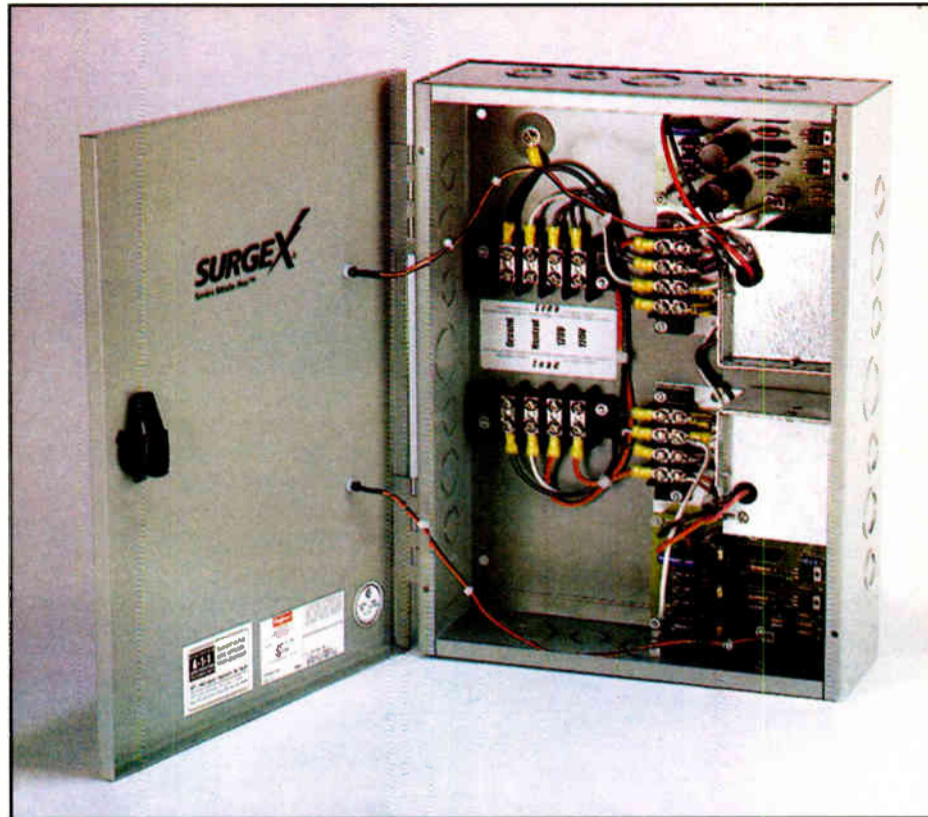
tions had no engineering to apply to the basic duty of broadcasters to inform their public. (Remember serving the "public interest, convenience and necessity"?) The contract engineer or the "DE" with 15 stations simply lacks the bandwidth and motivation, and needs a vacation.

So, Guy, you might check with the SBE and see where they are in the EAS process ... you are a veteran SBE member, aren't you?

Keep slugging and growing, my masked friend.

*The author lives in Denver. He says he has been in electronic media long enough to remember what a Mechanical Reproduction Announcement is.*

*Masked Engineer Guy Wire's comments, and his reply to this article, are available at [www.rwonline.com](http://www.rwonline.com). RW welcomes other points of view.*



Surgex is among companies that make suppression equipment.

require a UPS, Gladis said, preferably the true online type. A delay will occur between the AC failure and the generator coming online. During that period, a UPS will ensure that rack equipment and ancillary gear will continue to function glitch-free.

Sources for this article agreed that when shopping for power conditioning and gen-

erator equipment, the best practice is to ask a company for its customer list, and check it for other broadcasters and groups. The market is flooded with inexpensive products, and the old axiom that you get what you pay for most definitely applies.

*Tom Vernon is a multimedia consultant working in Philadelphia. Reach him via e-mail to [TLVernon@blazenet.net](mailto:TLVernon@blazenet.net)*

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# EAS

► Continued from page 12  
are passive-aggressive as an industry.

You are correct that it can be fixed — or, more appropriately, improved. We're pretty sure that lives have been saved by EAS, so for them at least, it *did* work.

The basic platform has way more than enough power to do just about anything. The rules have been changed, are being changed (just watch Clay Freinwald work) and can be changed.

But you probably missed that EAS works best when the local energy is focused on those local trust relationships — broadcasters and authorities working together.

One real problem is that by the time EAS was required, many sta-



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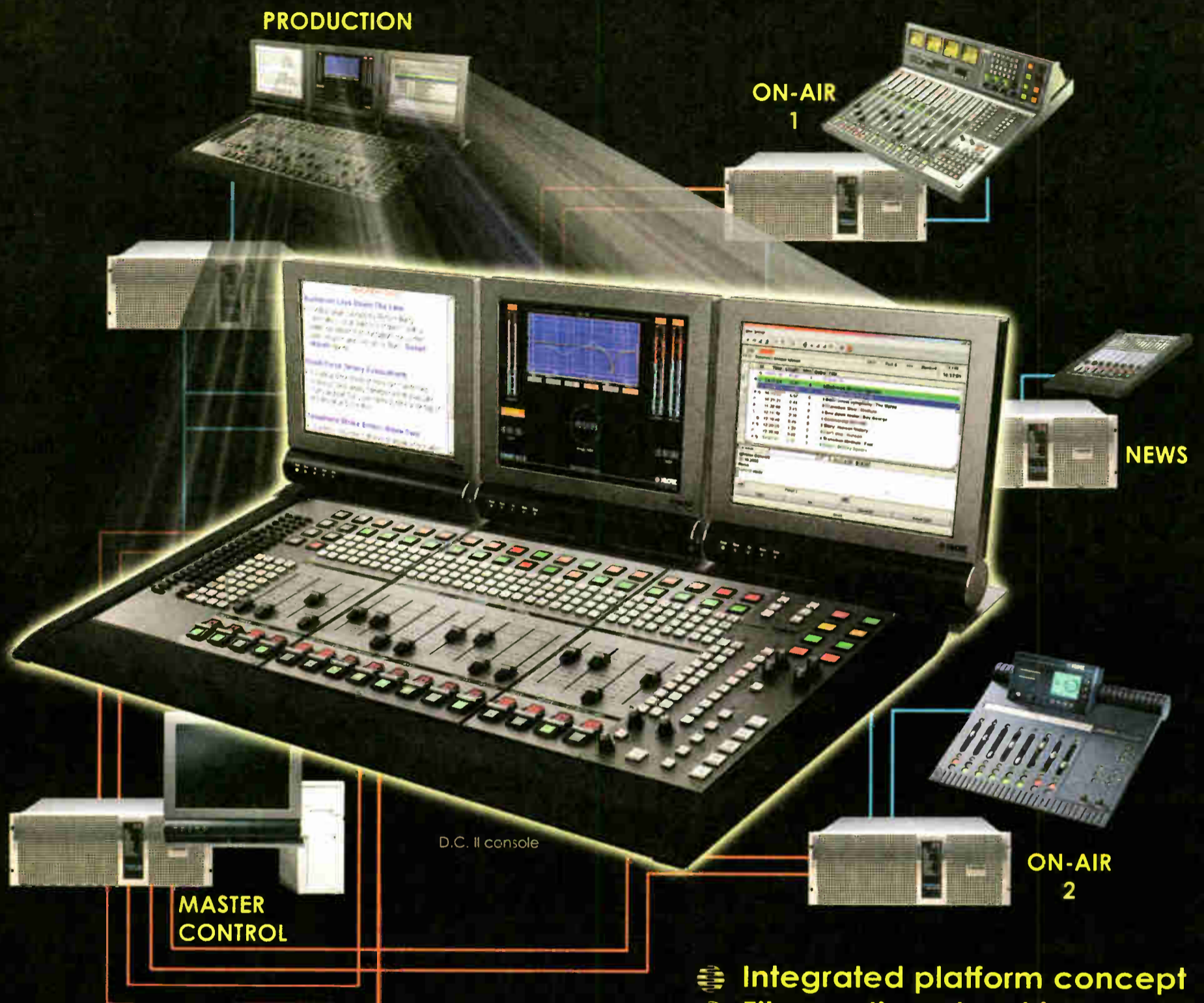
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MANAGEMENT CORNER

## Women: Key in a Tough Economy

by Vincent M. Ditingo

"Keep the customer satisfied," Simon & Garfunkel once sang. But for radio, especially music-formatted stations, that philosophy apparently has not applied to female listeners.

what programming elements directly affect women.

Arbitron/Joint Communications interviewed via telephone 1,060 female Arbitron diarykeepers aged 18-54 to find out what they want from their radio stations. (Although diary-

ed by morning or afternoon drive-time "shock jocks" target, indicated they would tune out if the content were inappropriate for children.

The bottom line here is that today's radio station must be "family friendly" so mothers can listen to their favorite stations along with their children, especially when driving to school and to and from other everyday events.

Overall, 71 percent of women strongly agreed that "rude announcers" would cause them to tune out, while 59 percent of them said "cheesy or phony announcers" would also be a tune-out factor.

### New times

The new findings point to a need for less-offensive material as well as a reexamination of comedic and other programming elements, particularly since the terrorism and other disturbing national events in recent months.

The study's authors noted that participants used a series of words to describe what they consider/perceive as offensive material including "crude," "lewd," "racist," "sexist," "profane" and "obscene."

Meanwhile, not surprisingly, the leading tune-out factor fell under the heading of "too many commercials." A perennial tune-out factor for both men and women over the years, the situation has been exacerbated during the past 18 months as many stations try to stretch their spot inventory in a tough economy.

Contest promotions are cited as potential tune-out factors. Almost 40 percent of women do not want to hear any on-air contesting while 23 percent found contests entertaining. Only 11 percent said they have listened to radio

See MANAGEMENT CORNER, page 27 ▶

## Hot Formats: News/Talk, '80s, Christian

by Ken R.

Echoes of the Sept. 11 terrorist attacks continue to reverberate through the radio industry. News/talk, already the No. 1 format, got a huge boost from recent events as Americans sought the latest developments and wanted to share their thoughts.



Guy Zapoleon

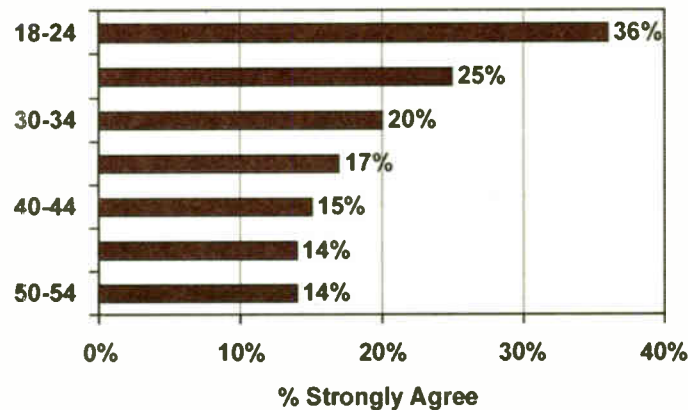
"The minute the crisis started, news ratings probably tripled and quadrupled," said Guy Zapoleon, president of Zapoleon Media Strategies of Stafford, Texas. "Even if the situation levels off, the events have created a new level of interest."

Consultant George Williams, who primarily works with news/talk stations, agreed.

See HOT FORMATS, page 20 ▶

### Contesting Loses Appeal in the Upper Ends of the Demo

#### Women Who Tune in for Contests



Source: Arbitron and Joint Communications

According to Arbitron data, overall 12-plus audience shares for females have been in a steady decline for nearly 10 years. Indeed, listening levels have dropped nearly 17 percent from spring 1993 through spring 2001, underscoring the fierce competitiveness for women among all media in recent years.

This disturbing trend prompted Arbitron, along with Joint Communications, a strategic media and marketing company, to undertake a comprehensive study this summer on

keepers from all of Arbitron's identified formats were included in the survey, the findings mostly apply to music radio stations.)

### Inappropriate content

In this era of so-called shock radio, one sentiment that comes across strongly is that women prefer radio stations they can listen to with their children.

Interestingly, 65 percent of women in the younger 18-to-24-year-old cell, which many rock music stations front-

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# Hot Formats

Continued from page 19

"You'll see some listening patterns shaken up before things settle back to normal," said Williams, president of his own firm based in Dallas. "There is a great deal of interest in current events."

Dan Vallie, CEO and founder of Vallie-Richards Consulting in Alpharetta, Ga., said Arbitron ratings for the last month of summer illustrated the trend toward current events programming — most dramatically in New York, Los Angeles and Chicago.

Also in the end-of-summer period, in Boston, news/talker WBZ(AM) went from a 7.2 share to a 7.6. In Detroit, full-service WJR(AM) jumped from 5.7 to 6.6 and in Philadelphia, news station KYW(AM) increased from 6.8 share to 7.1. All three stations lead their markets in the 12-plus demographic for all dayparts.

"And news/talk will remain hot as long as we stay in this consciousness," said Vallie.

But these information/conversation formats were 800-pound gorillas already. The research division of New York-based Interep shows that news and talk stations combined to grab more than 13 percent of the 12-plus audience Monday to Sunday, 6 a.m. to midnight in the Arbitron spring 2001 survey.

## Urban and '80s

The nearest competitors are the urban formats that own a little more than 11 percent. Urban, a relatively new format, already has spawned urban/contemporary, rhythm and blues and urban oldies.

Radio consultant Don Hallett of The Positioning Works sees a lot of interest in the '80s format.

"It's not working everywhere, but it is still working well in some markets," said Hallett. "The owners may never

become No. 1 but they will make money with it."

Vallie said while the '80s format starts off strongly for several books, it usually cools in time.

"It's unique and very focused, but many of these stations tend to evolve into a combination of '80s and '90s or hot adult contemporary," said Vallie. "Seattle's KYPT(FM) went from a 1 share to about a 3.9 in one book (with a flip to '80s format), but most stations are looking for a way to give the '80s format legs."

## Migration

Michele Skettino, vice president of marketing communications for Interep, said that in order for an '80s station to gain an audience, the bodies have to come from somewhere else.

"You might see a decline in hot adult contemporary listeners," said Skettino.

But she said the numbers of urban and Hispanic formats have been increasing in recent years, driven largely by growth in those population sectors.

"The urban formats have also been growing because the great things the artists are doing with the music," Skettino said. "Trends start in the

contemporary and it has been No.1 forever in the 12-plus demographic," said Zapoleon. "I think that is one of the hottest formats now."

Another of his Hartford clients is rhythmic crossover WZMX(FM).



Michele Skettino

"It just exploded in 18-34 listeners, going double digits and demolishing the top-40 competition," said Zapoleon. "The core artists in this type of format would be people like Jay-Z, Nelly and Missy Elliott."



Dan Vallie

the market, but they will make a strong impact," said Vallie. "I think in these times America is seeking something, a spirituality or whatever and these stations fill that need."

Stations consulted by Vallie have no preaching on the air and the formats are music-based and targeted to the 25-54 demographic.

"We were sitting in research studies where people were looking at other formats and we would keep seeing interest in Christian music," said Vallie. "The time is right for this to happen."

Ott spoke highly of the smooth jazz format.

## New Americans

"It could be the beautiful music of the 21st century," he said.

Ott also said changing U.S. population demographics will alter the complexion of the radio industry.

"The day will come in some markets — and not just San Antonio and L.A. — where Hispanic formats will be accepted more and more," he said. "There are a number of good crossover artists that can make that happen."

Mark Fratrik, vice president of BIA Financial Network, said the Telecommunications Act of 1996 produced more experimentation.

"Everyone is looking for something new and because radio is competitive, the concept of what's a hot format is always changing," Fratrik said. "Operators are always searching to find the next niche."

## News/talk will remain hot as long as we stay in this consciousness.

— Dan Vallie

urban formats and are now crossing over into mainstream."

Zapoleon had a little different opinion on what's hot and what's not in the music formats.

"One of our clients, WRCH(FM) in Hartford, (Conn.) is mainstream adult

Vallie recently signed on a new type of oldies station in Chicago. Known as "The Drive," Bonneville's WDRV(FM) is targeted at the 25-54 demo and uses an expanded playlist.

"It's not just the same 400 records, and the production style is intelligent and natural," Vallie said. "We worked with WDRV's PD, Greg Solk, to ensure that the music is based in the '70s but also features some '60s and '80s as well. The station became No. 1 in men 25-54 in just one book." (Monday to Sunday, 6 a.m. to midnight).

Richmond, Va., radio consultant Rick Ott, president of Ott & Associates, said an important ingredient in any oldies format is personality.

"Oldies can be a gold mine, but a lot of stations aren't doing it right," he said. "It requires more interaction with the audience, which you can't get from a computer sitting on a desk. A deep playlist helps, too."

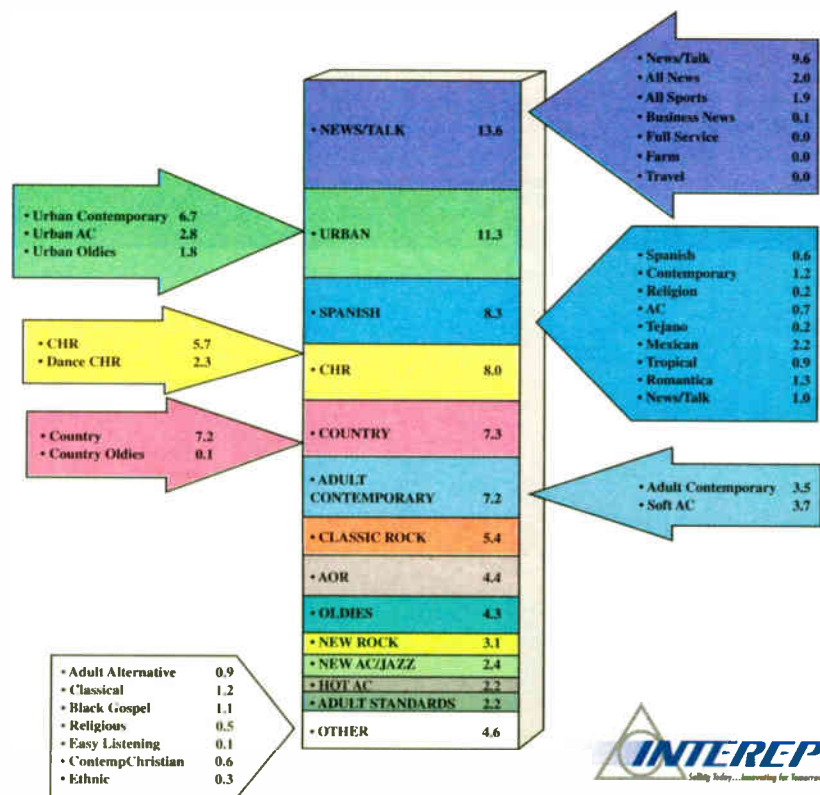
Salem Communications Corp. operates from Camarillo, Calif. Together with programmer Dan Vallie, Salem is responsible for the growing number of contemporary Christian stations known collectively as "The Fish."

"The first one was KFSH(FM), Los Angeles, which was exciting and fun," Vallie said. "To do a format like this, you have to be open-minded. We wanted to take Christian radio to a higher level."

Vallie said other "Fish" stations have gone on the air in Atlanta, Portland, Ore., Chicago and Sacramento, Calif., with more on the way.

"They won't necessarily be No. 1 in

## SPRING '01 AUDIENCE SHARE BY FORMAT PERSONS 12+



## STATION SERVICES Fisher/NBG Re-Ups Bruce DuMont

Glen Fisher Entertainment has renewed Bruce DuMont's "Beyond the Beltway" political talk show for two additional years.

"Beyond The Beltway with Bruce DuMont" airs Sunday evenings from 6-8:00 p.m. CDT. The program is broadcast live from The Radio Hall of Fame at The Museum of Broadcast Communications in Chicago.

"'Beyond the Beltway' takes America's political pulse from coast to coast and border to border. The show presents a balanced and spirited forum of intellect and passion," stated Ollie Homes, vice president of operations for NBG.



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World Radio History



# Plan a Great Sales Campaign

by Ken R.

All too often a local retail advertiser will stick his or her toe into radio with a hastily prepared series of spots. The campaign inevitably disappoints both the advertiser and the radio station. The retailer scurries back to the local newspaper where results are underwhelming and expensive, but at least verifiable.

What makes for a successful campaign? Consider the example of WSIX(FM).

While traditional medical doctors don't advertise on the radio, specialists such as cosmetic surgeons, dentists, chiropractors and hair transplant facilities have found success with broadcast campaigns.

## Live testimonials

An example of this kind of radio love affair is ongoing in Nashville, Tenn., where Clear Channel's WSIX account executive Alisa Valentim was able to help local laser eye surgeon grow his business by a factor of 12 within a little more than a year.

"They had a preconceived notion of what they wanted to do after talking to some consultants," Valentim said. "They were told to be on the air one week, off the next and to only use recorded spots. We came up with a completely different idea and did a six-week trial which blew their phones off the wall."

WSIX used morning man Gerry House and several other on-air and off-air staff who actually underwent the surgical procedure, which improves vision and eliminates the need for eyeglasses or contacts.

A series of live testimonials from House, Valentim, other station staff and Dr. Stewart Shofner about the success of their laser eye surgeries provided a level of comfort and trust for potential clients in the initial series commercials.

And with such a success with the Valentim-designed radio campaign, WSIX has signed the good doctor to an exclusive ongoing schedule of three commercials per week.

Shofner's business manager, Beth Hackett, said the telephones continue to ring.

"We went from getting about 10 appointments a month before the (WSIX) campaign to more than 120 a month today," said Hackett. "Since we've been with WSIX, we did a little over \$1 million in sales with 426 patients in the last year."

Valentim applied her experience with testimonial advertising when she contributed to a Nutrisystems weight-loss program radio commercial and was surprised at the response.

"I became a celebrity and came to believe in the power of radio," said Valentim. "I was a nobody but I was constantly being recognized and I thought if it worked for weight loss, it could work for Dr. Shofner. Our morning man (Gerry House) makes each spot unique."



Dr. Stewart Shofner

Hackett said Shofner first went on radio in 1997 after trying other advertising media. "We had been told by our consultants not to use WSIX because it was too expensive," said Hackett. "Those consultants were idiots."

"When we advertise on the radio, it's usually tied in with a charity," said Hackett. "We have held breakfasts at the national guard armory where all the proceeds go to the Make a Wish Foundation. We also sponsor an annual concert and raise money for heat relief programs down here so (poor) people can get air conditioners."

Hackett gives WSIX the credit for putting Dr. Shofner on the map.

## More for radio

"Nothing has ever paid off like this station. After the Sept. 11 terrorist attacks we stopped advertising in the newspapers and with billboards, but we will never drop WSIX because they give us exclusive endorsements which is the real key."

Hackett said Shofner spent about 10 percent less on newspaper advertising after the WSIX campaign began late last year, adding the difference to the radio station's coffers.

These kind of successes might give you ideas for campaigns of your own. There are online resources to help.

James Alfred Davis is the managing director of the Radio Advertising Bureau's member services. The RAB makes a daily study of successful radio campaigns and documents them on its Web site, [www.rab.com](http://www.rab.com).

"The goal was to document what we

already knew," Davis said. "We now have over 2,000 success stories divided by retail categories online and it's one of our most important sales tools."

He said this section of the Web site is accessible without a RAB subscription.



James Davis

Davis said a common mistake radio salespeople make occurs at the outset of a campaign.

"How can you possibly know whether your campaign is right if you don't ask before the first commercial runs, what the objective is?" said Davis.

"Things like smart scheduling and well-written creative play a part in every Radio Gets Results success story, but the most fundamental key to overall success is a well-executed needs analysis."

He said this important phase of selling

establishes rapport and brings objectives to the surface.

"Part of solving a problem is identifying it and that means asking a lot of questions," Davis said. "But before you get to that stage, you need to do your homework."

RAB has an Advertiser Needs Analysis template available on its Web site.

Davis recommends that radio salespeople ask potential clients, "If someone is in the market to buy a (fill in the blank) today, why won't they buy it from you?" Davis said the answer can reveal a wealth of information.

Other nuts and bolts topics, according to Davis, include store hours, best days for business and who the decision-makers are for this product. The client should also be asked about his competitive situation in the market and the existing customer demographic profile.

Davis suggests investigating all co-op opportunities and the client's general preferences in advertising style. Some local advertisers prefer testimonials, others like comedy or a straight approach.

"A salesperson should be prepared with a list of questions going in, but the questions shouldn't be so narrow that he or she misses a serendipitous opportunity," Davis said.

## Radio Revenue Roller Coaster Ride

How has radio performed in recent months? For that matter, for the past decade?

The Radio Advertising Bureau predicts that radio sales this year will be down overall compared to a year ago, for the first time in 10 years (although it points out that sales through the end of September are still 11 percent higher than the first nine months of 1998).

RAB's monthly numbers for the past two years show a historic increase followed by a dramatic drop. The trend of escalating sales reached its zenith in the middle of 2000, when national revenue, for example, was up 40 percent in March compared to a year earlier, and local revenue jumped 22 percent that May.

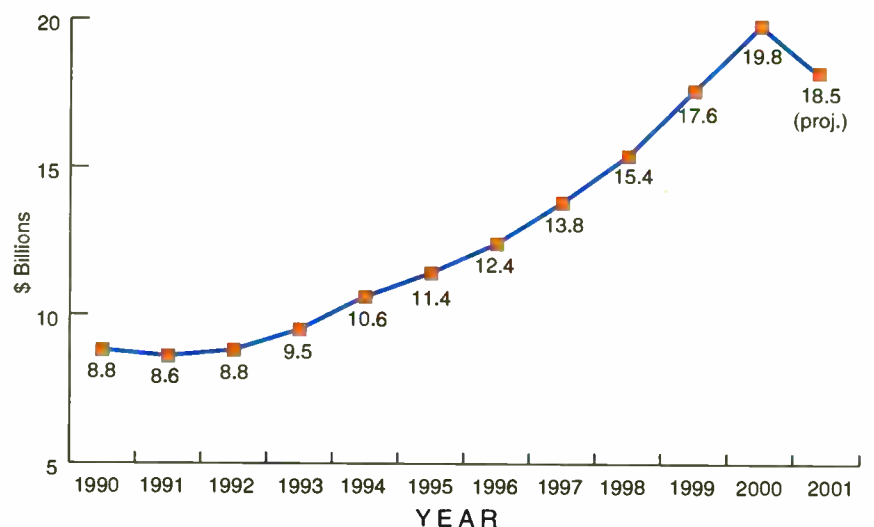
National revenue first showed a drop in September of last year; local first showed a negative in December — the first such drops since December 1991.

Most of 2001 has seen single-digit decreases in local revenue and double-digit declines in national numbers. In September alone, local sales were off 12 percent. Local revenue accounts for 80 percent of most broadcasters' revenue.

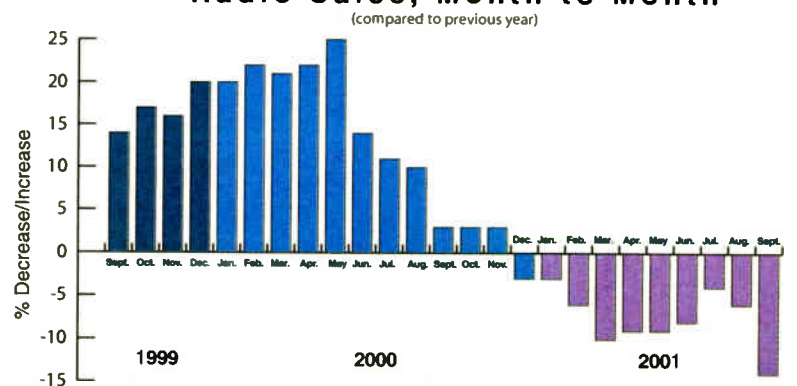
The once-anticipated recovery in the fourth quarter did not take place. The trauma of Sept. 11 contributed; it not only hit the economy, but inspired many broadcasters to switch to a costly, non-commercial, all-news format for days or even weeks.

Gary Fries, RAB's president, said the final outcome for 2001 would be difficult to predict — numbers won't be available until February — but he expected that the year likely will end in an overall drop of about 9 percent. That would put radio revenue this year at \$18.5 billion.

### A Decade of Radio Revenue



### Radio Sales, Month to Month



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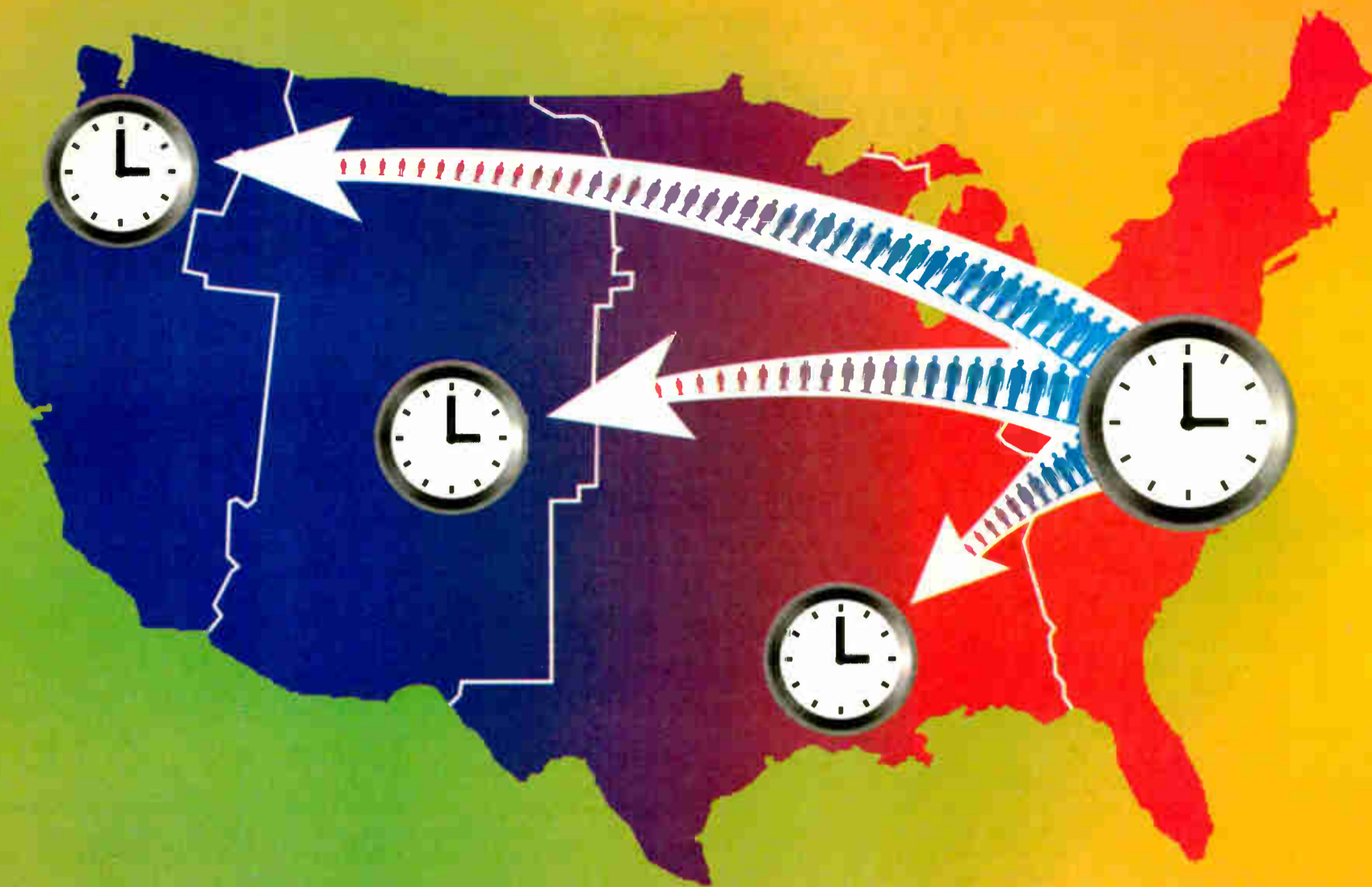
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PROMO POWER

# Run Better Promotion Meetings

by Mark Lapidus

I've had promotion meetings that last three hours. I've had sales people crying in promotion meetings. I've seen a sales person leave a promotion meeting with an idea so good, she made \$75,000 with it less than two weeks later.

I've seen marketing directors decide not to have the meetings at all, thinking they can solve sales and programming matters by themselves.

## Seen it all

Stick around marketing and promotions long enough and you too will see it all.

Unfortunately, what you'll rarely see are promotion meetings that are run well.

Have you stopped lately to consider how many hours a week you spend in meetings? If you're like most radio managers today, you spend at least five hours a week in meetings.

At least once a year, invest in a few focused minutes to determine whether or not all those meetings are productive — and if they are not, how you might convince your immediate superior to allow you to use your time more effectively.

Of all the meetings you may consider cutting, I highly recommend that you not cut your promotion meeting.

Why? If done properly, a promotion meeting gives your sales force the ability to represent their clients and gives you — as a marketing, promotion or program director — the opportunity to use those same clients to tremendous benefit to provide prizes and other resources for your listeners.

Most people dread promotion meetings because they are neither well-organized nor well-conducted and take longer than they should.

Here are some proven methods

that'll help you turn that weekly nightmare into a fun, productive time.

All promotion meetings should be in the morning when people are energized. And you won't have account executives begging off late in the day when they need to be calling on accounts.

Contract with all parties for one hour. I use the word "contract" intentionally. Everybody needs to know that you're committed to getting out of the room in one hour and that every minute is of value. This will help to curtail those who have a tendency to dominate the ticking clock week after week. The peer pressure of being concise is a powerful weapon.

How can you possibly do a promotion meeting in one hour? Either the marketing or promotion director has pre-meetings with all sales people who will attend.

While this may sound redundant, it isn't. The pre-meeting is for brainstorming initial concepts for clients and is scheduled at the convenience of the account executive and promotion director.

The actual promotion meeting is the AE's time to present the selected pre-meeting concepts to the other managers in attendance: the program director, marketing director, general sales manager and, in some cases, the general manager.

Either the marketing or promotion director must control the flow of the meeting. This requires action, a firm demeanor and a strict awareness of the passing of time.

The meeting leader knows from the

pre-meetings (and weekly sign-up sheet) how many sales reps will be attending. She should take that number and divide it into 50 minutes; this gives her a pretty good idea how much time can be allocated for each rep.

If all the ideas from the pre-meeting are shot down by those in attendance, guidance should be given to that sales person about what track the PD or market director would like him to pursue and then, if needed, that same AE and the promo director would bounce from office to office later in the day with a solution more suitable.

With all this action, how do you stay organized? Try just one form for each concept/client.

At the bottom of the form, leave room for a signature sign-off of all the managers in attendance. The form is not valid until signed by all.

Although it's tempting, don't make copies until the form is completed and signed. Incomplete forms will always create problems.

Why shouldn't a marketing director work all this out in private meetings with AEs? Because unless that marketing director is a genius and has absolute authority to deliver on promises made, a group meeting is vital.

I have worked at stations where the general sales manager represented all her account executives.

While this would seem to save time, it doesn't. It simply isn't possible week

after week for the GSM to spend enough time with AEs to find out what their clients really want to accomplish.

And having the account executive represent the client is tricky enough. If you add another person to the mix, it's like playing the game of telephone, in which the message can get very confused.

If you spend most of your time at these morning meetings discussing sales matters, when does the PD and promotion team concentrate on doing things just for listeners with little or no sales implication? Fair question.

## Daily discussion

This exchange is an ongoing daily discussion. If you feel you need a weekly meeting, someone — maybe everyone — in your structure isn't thinking clearly about how important the marriage between promotion and programming has become.

After all, married couples who really communicate once a week rarely have successful relationships!

Finally, conclude each promotion meeting with a review of how things have gone at appearances during the last week. Talk about what went right and wrong and most importantly how things can be improved.

Now — I did mention the concept of fun. This is more of an attitude than anything else. If you can't inject humor into your promotion meeting, think about people who manage to have fun working in other industries like insurance, law, accounting or construction.

I'll bet none of these folks have ever had to brainstorm about how best to give away cars, concert tickets, trips and money — all the elements of glamour and luxury so eagerly perceived by client and listener alike.

Mark Lapidus is president, Lapidus Media. Contact him via e-mail to mark.lapidus@yahoo.com.

**Stick around marketing and promotions long enough and you too will see it all.**

## Radio and TV's Finest Women

The American Women in Radio and Television have named the 50 most influential women in the broadcast industry in its new book, "Making Waves."

The book includes among its contemporary achievers Catherine Liggins Hughes, founder and chairman of Radio One; and National Public Radio/ABC News correspondent Cokie Roberts. Susan Stamberg, NPR's senior correspondent is also featured.

The AWRT, which celebrates its 50th anniversary this year, honored the women on its list with a luncheon in New York City in October. Roberts and Stamberg attended, as did Diane Sawyer, Dr. Joyce Brothers, Julia Child, Lesley Stahl and Linda Ellerbee.

Each of AWRT's Top 50 women in attendance read passages from their stories in "Making Waves." The book is a hardcover edition and costs \$27.95.

Andrews McMeel Publishing publishes "Making Waves." To order, call Andrews McMeel toll-free in Kansas at (800) 826-4216.

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# Management Corner

► Continued from page 19  
"specifically to win" something.

The number of women interested in radio contests, however, decreases with age. The authors concluded that as time pressures for women increase, they prefer to listen to music on their favorite station rather than be distracted by a contest.

In fact, women said "favorite music" is the biggest reason for tuning to a particular station.

Eighty-seven percent of the women in the survey said "music I like" is the major factor for tuning in, followed by 76 percent who said that "lots of

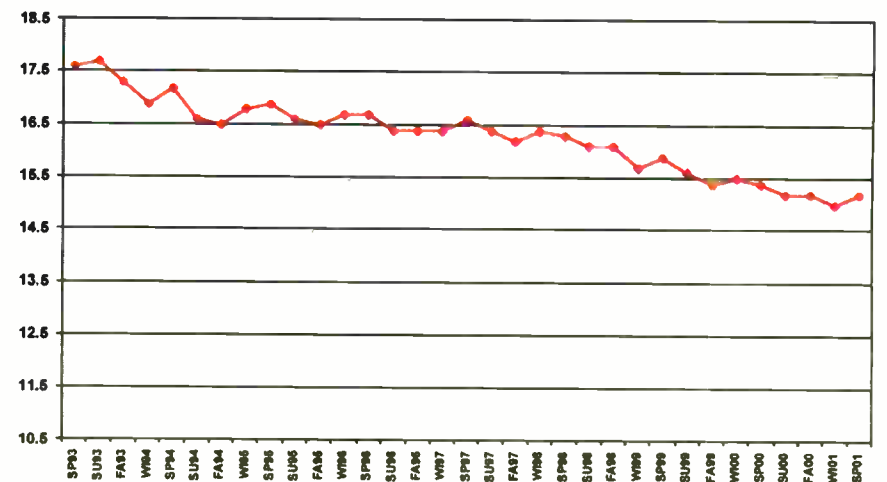
music," regardless of format, is enough motivation to select a station.

According to the study's findings, the demand for "music I like" did not change through the age cells, but the preference for "lots of music" declined with age.

### Tune-in factor

For instance, 90 percent of women aged 18-24 cite "lots of music" as a tune-in factor, but only 66 percent of women 50-54 would say the same thing. Meanwhile, 58 percent of all women in the survey said they would tune out if the station aired a song

## Women 12+ AQH Ratings Spring 1993 - Spring 2001



Source: Arbitron and Joint Communications

### It's in the Research

There is little doubt among radio executives that research plays a critical role in program strategies as well as in negotiating spot campaigns. This is true especially in tumultuous economic times like these.

For radio broadcasters, research data can help define the station's image through better daypart management. More important, research findings can paint for advertisers both a broad and narrow picture of a station's demographic profile. In essence, it is the fabric of the radio station and/or network radio business.

"Research remains the cornerstone in dealing with negotiating strategies and techniques," said Paul Anovick, president of Media Training Systems, which specializes in radio sales training. "That's especially true of qualitative lifestyle research."

In recent years, qualitative data has been a key ingredient to create a compelling audience story for select radio outlets such as some talk and classical music stations that typically don't garner the high ratings numbers that a contemporary hit station wins.

"Knowledgeable buyers are looking at qualitative research if their (buying) schedules allow," said Peter Cleary, president of The Concert Music Network, a satellite-delivered network of more than 30 commercial classical music stations that has an affluent audience base.

In general, radio managers we've canvassed over the past year agree that all kinds of research, especially customized listener surveys and focus-group studies, help to both maximize the creative dynamics (programming) and marketing dynamics (sales) of a station.

— Vincent M. Ditingo

they did not like.

Aside from a more discriminating music playlist for your targeted audience, other key steps your station can take to expand your female listener base include citing song titles and artists over the air.

### More info

The study noted that 55 percent of women radio listeners want to hear more titles of songs and artists identified over the air rather than "funny DJs," cited by 45 percent as a reason to listen.

According to the study's authors, women answered without prompting that news was "one of their loves about radio." Because of the hectic lifestyle pace of today's female listeners, "they are relying on radio to keep them up to date with what's going on

in the world," the authors stated.

Of great importance to station management and advertisers is the fact that women can influence household purchase decisions heavily. To that end, stations would be smart to establish a frequent-listener club that offers discounts from local retailers/advertisers, among other rewards.

"Women who belong to frequent-listener clubs are valuable targets both for stations and advertisers," the authors stressed.

"because their time spent listening is double that of a non-club member."

Vincent M. Ditingo is an assistant professor and coordinator of the radio program at the New York Institute of Technology.

He can be reached via e-mail to [vditingo@aol.com](mailto:vditingo@aol.com).

## The number of women interested in radio contests decreases with age.

### You Read It Here ...

#### 20 Years Ago

"While participating on a panel at the recent NRBA convention titled 'Engineering/Management Coexistence: The Impossible Dream,' I quickly became aware that engineers are very concerned about their future and the generally low status of their profession. What is going to happen? In which direction is the industry heading? These concerns are all too real for today's engineer.

"Back in the early days of broadcasting, engineers were responsible for the complete operation, and most managers were engineers. Today, engineering has been reduced to a back room and to a minimal staff."

— Rick Edwards  
Director of Engineering,  
Guy Gannett Broadcasting  
"Questionnaire for Engineers"  
November 1981



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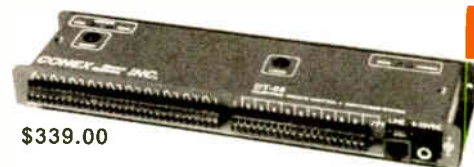


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\*\$99.00 down and 36 monthly payments of \$99.00. \$1.00 purchase down after 36 months. Subject to credit approval. Monthly payments slightly higher for business customers. 36 months. Monthly payment price does not include State Sales tax which will be added. See additional details and required credit application.

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CT100 ONLY \$35.00



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# Studio Sessions

**HHB Radius  
Tube Processor  
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See Page 34**

Radio World

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December 19, 2001

PRODUCER PROFILE

## He Studies Folk to Make Great Spots

*Bob Holiday Knows What Motivates People to Buy*

by Ken R.

Most production directors facing a stack of scripts have one priority: getting them on the air before the sales reps start screaming.

Bob Holiday, production director for three Los Angeles stations, has one eye on the clock and the other on how his spots will motivate people to buy the product.

"Most guys just pull some background music and crank it out," said Holiday, production director for Christian rocker KFSH(FM), news/talk KRLA(AM) and KKLA(FM), a Christian talk station. The owner is Salem Communications.

"Many production directors don't

analyze the validity of the marketing approach of their commercials. If you know what motivates people to buy you have a big advantage."

"I go to the seminars, read the books about persuasion and really enjoy learning how human beings respond," Holiday said. "We actually serve the function of an ad agency to many of our local clients."

### Strictly commercial

Holiday is not burdened with voicing station liners or any other tasks unrelated to creating commercials. After a career in smaller markets where everyone did a little of everything, he enjoys being able to focus on one job now.

The cluster boasts a three-person writing staff that includes creative director Dave Deno, Blaine Parker and Kate Eisenhauer.

"If another L.A. station is even lucky enough to have a writer, he or she just relieves the sales rep of a little work," Holiday said. "But not even the sales people are the right ones for this job. Stations should invest in real writers to make it work."

Apparently the investment pays off. Holiday and his stations have won Addy, Mercury, Radio & Production and Mobius awards.

"I'm very proud of the Mobius because we were competing against some of the biggest agencies in the world," Holiday said.

Although he started back in the days of razor blades, Holiday jumped with both feet into the world of computer audio.



"I'm a gadget freak, so when these things came along I embraced them immediately," Holiday said.

"I started with Software Audio Workshop by Innovative Quality Software, which was revolutionary at the time because of its price. I recently

See HOLIDAY, page 33 ▶

## Pulling Gear for ATR Successor: RVR 1170

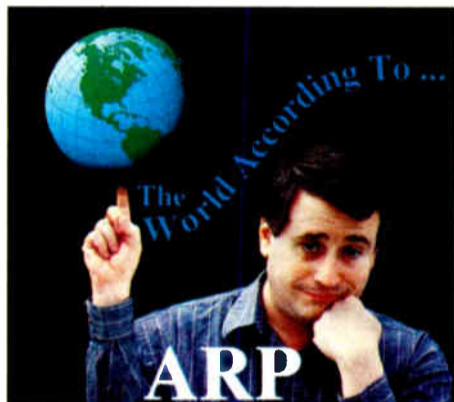
by Alan R. Peterson

Time to approach a topic I haven't mined for quite a few months: Annandale Terrace Radio, my little Part 15 AM station that I documented quite well earlier this year.

Only now, it's taking on a new moniker: Rolling Valley Radio 1170.

### Pleasant place

Since my marriage back in June, we have been looking to buy a house. A very pleasant place opened up back in October in a community called Rolling Valley, about 11 miles from downtown Washington. The neighborhood is perfect to reestablish my clandestine 100-milliwatt AM flamethrower.



once the stick is back up in the air.

My quest for cheap, used gear has not waned either. It would be difficult to justify a \$5,000 console for a sta-

**It would be difficult to justify a \$5,000 console for a station that only flies for four blocks.**

At first, I was not crazy about "Rolling Valley Radio." It sounded too rural, too granola-ey. It sounded like a station that should feature The Sunday Night Dulcimer Hour and deejays who say, "Hey, like, really ..." a lot. But frankly, there was nothing better I could come up with, so RVR it will be,

tion that only flies for four blocks. So just for nostalgia's sake, I fired up the Internet connection and conducted a search for some broadcast products whose names I had lost touch with over the years.

I had to see if any were still around.

See ARP, page 32 ▶

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from the editors of  
**Radio World**

# ARP

► Continued from page 31

My first stop was Micro-Trak. How well I remembered this Holyoke, Mass., company, which churned out products by the ton — phono preamps, cabinetry, tonearms and nifty portable sports mixers with built-in telephones.

Bob Shotwell, an engineer buddy of mine up in New England, told me he still has a couple of their phono amps that refuse to die. He reminded me that Grey Research was the predecessor to Micro-Trak, and that they were once on Grey Street in Holyoke; a city better known today for the Volleyball Hall of Fame.

## A quick poke

A quick poke in the URL address line to see if there remained any trace of Micro-Trak turned up something very far removed from radio, but smelled about the same.

A brand name "Micro-Trak" is held by an agricultural electronics company in Minnesota. The company was established in 1982 and hit pay dirt (so to speak) with a device called a "Calc-An-Acre," which tracks speed, area



Fig. 1: Shown is the Calc-An-Acre, a product AI was unprepared to find when he searched for a classic Micro-Trak turntable.

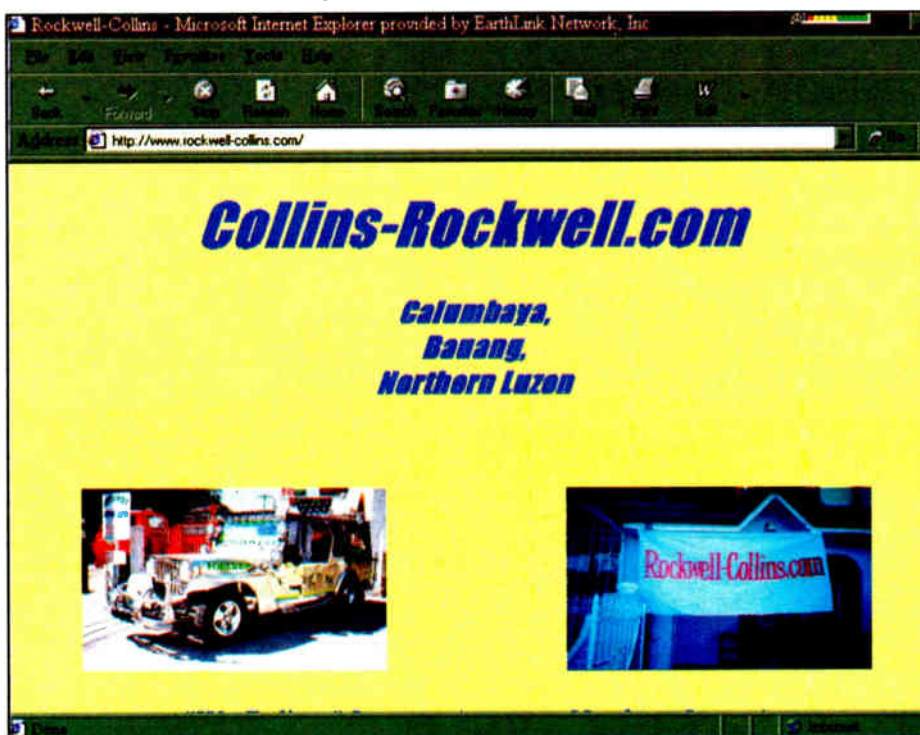


Fig. 2: It's not a Rockwell-Collins mixer, but a Jeepney, a vehicle ubiquitous in the Philippines.

and distance when working massive acreage on large farms.

It may be difficult to see in Fig. 1, but today's model of the Calc-An-Acre somewhat resembles the "brick" playback head of the ENCO DadPro digital storage system, facetiously labeled the "fish finder" back when the product was handled by other companies.

No sense looking for a turntable here. Time to move on.

I was also interested in knowing how difficult it would be to locate an old Rockwell-Collins rotary pot console.

I had no great love for those boards, preferring instead to obtain a Gatesway 80, which was my first pro board after college. Still, I did produce four award-winning radio spots on one particular 'Rocky back in the '80s, and felt a sharp pang of regret when I heard it got fried by a lightning hit.

A Web search for Rockwell-Collins brought me instead to Collins-Rockwell, which appears to be an ISP

in the Philippines. My editor tells me that the vehicle to the left in Fig. 2, is called a "Jeepney," a sort of open-air taxi that one rides in when feeling immortal — evidently it is not a stress-free ride.

Hats off to you guys.

A cart machine or two would have been nice to pick out of the vast warehouse that is the World Wide Web.

Audi-Cord machines are still offered by Harris. Surfing for "Fidelipac" leads one to "The Cart Guys" in Tucson, Ariz., still building and maintaining Fidelipac and Dynamax cart machines.

Spotcaster took me in a much different direction than I intended, however. I was taken to a site dedicated to The San Francisco Dog Blog — essentially, dogs in the news.

## Spotmaster.com

Among the stories I encountered during a November search: an elderly Florida woman whose dog defended her in an alligator attack, the fully restored kitschy fiberglass "Doggie Diner" icon of Ocean Beach, Calif., and Hindu nationals naming a puppy after President Bush in an outraged response to his naming a cat "India."

Any cart machines here? Nope.

So maybe it was Spotmaster. Look, I haven't seen one since 1980, so it's possible I got the name wrong. Would I find any cart machines at Spotmaster.com?

Yeah, I should live so long. This turned out to be a skimpy site that swapped a limited number of MP3s. Other than that, my search took me to Darwin 3D, an animation house that uses a computer program called "Spot Master" that "spots" where a virtual camera is supposed to be inside animated space.

And dare I mention Spot Master, the all-purpose textile spot-cleaning spray for carpeting, from your friends at HydraMaster Corp. of Mukilteo, Wash? I didn't think so.

In the course of deciding on a digital editor to do my IDs and promos, I wondered if anyone had one of the old Arrakis Systems Trak-Star units around. I first saw one at WARM(FM) in York, Pa., in 1994, and in spite of its limitations, its simple, uncomplicated screen appealed to me even then.

Given the advances in digital editors since that time, I was bound to find one at a good price. So I tried Trak-Star in the URL address line.

I ended up just outside of Flint,

See ARP, page 33 ►



# Holiday

► Continued from page 31  
switched to Vegas Audio 2.0 by Sonic Foundry."

He uses a PR&E digital board to feed the Vegas; produced spots are eventually ported to a Prophet Systems audio system for air use.

"The transition to digital has been a funny thing because you still have people who like to mix with the board faders," Holiday said. "Some people like to use an automated mixing board, but it's all pointless because in the computer itself you can do all the mixing and changing you want."

Holiday believes hard-drive editing obviates the need for most outboard gear.

"By mixing in the computer you don't add any noise and there's no chance for aberrations," he said.

## Space-age sounds

Holiday recognizes that some commercials out there in radio land are hard to understand, thanks to all the space-age music beds and effects.

"It can happen unless you plan it right," Holiday said. "Especially when the listener is driving down the freeway at 70 miles per hour with the windows down."

But how can a production director make those spots leap out of the radio?

"The common complaint is that the music is too loud or not loud enough,

but it really has more to do with equalization than volume," Holiday said. "I use subtractive EQ to tailor a music curve in the computer so that each individual voice stands out. I call it a 'smile' because of how the frequency curve looks at the dip."

He professes shock that more people don't use a technique like this.

"It should be a tip-off when you play a spot down the phone for a client and he says the music is too loud."

**This is an art, yes ... but it's also commerce.'**

Holiday looks at the frequencies between about 250 Hz and 5.1 kHz where the music is most likely to interfere. He uses an Aphex 1100 tube preamp but rarely uses his other outboard processors.

"This is an art, yes ... but it's also commerce," said Holiday.

Holiday said his stations are focused on local, direct advertising and serve as not just an agency and production house but a casting office.

"We actually bring in outside people when needed and, including myself

and Dave Deno, we have about 22 different voices to work with," he said.

The stations use background music libraries, but selectively.

"We discarded about two-thirds of the Killer Tracks Library and the Koka Media Library, which they also offer, until we found the CDs that work for us. We also use the Omnimusic library for the edgier material," Holiday said. "Then there's 'Not Just Jingles,' which has 20 discs or so that are very good."

in any profession."

Although his own voice has helped him tremendously, he feels his approach to life is more important.

"I have a lot of fun and that is reflected in the degree to which my production is involved with goofy characters and accents," he said. "I enjoy acting and radio is just as much acting as what TV performers are expected to do."

## Diversify talents

Holiday advises aspiring production wizards to understand the equipment, learn about computers and have goals.

"You'd better be a good producer too, or you may not have a job tomorrow," he said. "On-air skills are not enough. I had great ratings when I was a jock in Salinas, (Calif.), but if that was all that I knew I wouldn't be working today."

In this age of voice tracking, Holiday believes that production skills will trump a great voice in most situations.

"When I went for a previous job interview, I had an aircheck tape and a production demo, but they hired me for my production skills," Holiday said. "I study this stuff and breathe it every day."

Bob Holiday also takes on freelance announcing gigs and can be reached through his Web site, [www.bobholiday.com](http://www.bobholiday.com).

Ken R. was a production director in the days of steam-powered transmitters. His voice was constantly mistaken for that of a small child.

Reach him at [Ken@KenR.com](mailto:Ken@KenR.com).

# ARP

► Continued from page 32  
Mich., at the Web site of "Trak-Star by Hougan," a company that manufactures drills, saws and cutters for railroad construction.

I couldn't help but grin at the irony: I was, after all, searching for a product to build tracks.

Bailing on that, I plugged "Trak-Star" into a search engine, which led me back to Minnesota agricultural giant Micro-Trak, which offered its own product called Trak-Star.

**I tried Trak-Star in the URL address line and found a company that manufactures drills, saws and cutters for railroad construction.**

This one is an ultrasonic speed sensor that tells you how fast your reaper is going, without relying on false information from "wheel slip-page, waving weeds and field debris," so the Web site proudly boasts.

Owing to a lack of all three in my home studio, I figured I had wasted enough time on the Internet and turned it off.

When RVR-1170 takes to the air in the near future, I suppose it will have to be with the same exact gear I

have for it now: two Walkman-style CD players, a Technics cassette deck, a Sony portable DAT recorder, and an audio computer running the LPB WebJockey program and the Arrakis Digilink Free software package. All through a vintage Sparta A-15 five-pot mono mixer.

By the way, my afternoon on the Web was not a total loss. The information and pictures I found for the Sparta-Cetec product line were worth the effort.

Visit Barry Mishkind's outstanding [Oldradio.com](http://Oldradio.com) Web site and link to the Hardware archives to see what

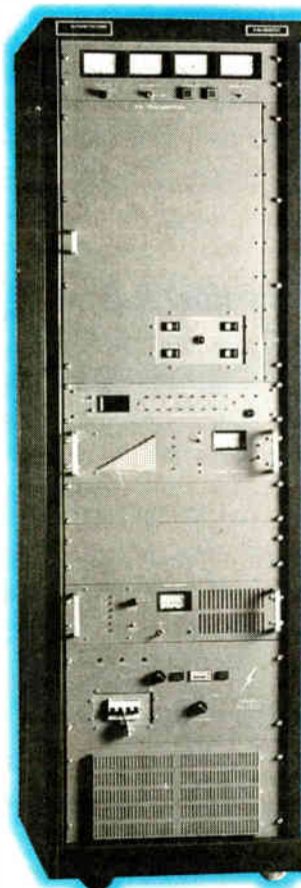
I saw.

And if you can truly stand the fright, click the icon for the Spartamation system. You will never gripe about your own station's digital system ever again.

*Happy Holidays from Al's new family, including his mate and RW section editor Michele and daughter Ariel, and share their hopes for a grand 2002.*

Reach Al via e-mail to [alan.peterson@earthlink.net](mailto:alan.peterson@earthlink.net).

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## PRODUCT EVALUATION

# Processor Right for Voice, Music

by Ty Ford

The HHB Radius 40 Tube Voice Processor (\$749) is a re-badged TL Audio 5051 from the United Kingdom.

If you were to take its name literally, you might not realize that its line and instrument inputs and linking capabilities suggest it is more than just a mic preamp/voice processor.

## Features

The Radius 40 is a 2 RU unit with preamp, compressor with makeup gain, gate, four-band, fixed-frequency EQ and output gain control. Three Sovtek

7025/12A7XWA vacuum tubes are used, one each for the preamp, compressor and EQ sections.

A four-position rotary switch allows choices for four types of input: a 48 VDC, 10 mA phantom-powered micro-

phone, phantomless mic, line and instrument. Following the input is a button for a low frequency cut filter,



spec'd at -3 dB @ 90 Hz, 12 dB/octave.

This blows off unwanted low frequencies before the compressor and

multiband EQ sections.

The input sensitivity control also acts as a Drive control, allowing adjustment of how much the tube is involved in the circuit. A peak LED begins to glow when the unit is 5 dB below clipping. A Drive LED indicates the amount of tube effect.

## Around back

On the back panel are XLR microphone, XLR line and 1/4-inch TS unbalanced line input jacks.

A pushbutton on the back panel switches the XLR line input between +4 dBu and +18 dBu, and the TS unbalanced input between -10 dBu and +4 dBu. Among other things, this means you can use the Radius 40 to bump up a semi-pro level to pro.

Finishing up the back panel are a 1/4-inch link jack for stereo operation and a 1/4-inch unbalanced sidechain which, when used with an external equalizer, results in a frequency-dependent compressor. Having the sidechain insert jack work with a reverb or effects device would be a nice touch. I tried it, but it didn't work that way.

Both XLR balanced +4 dBu and 1/4-inch unbalanced TS output jacks are provided and both are always active. The power supply is switchable 110/220 VACs. A standard IEC power connector is used. A peek inside revealed that the PC boards are nicely laid out with no transformers in the signal path.

## Softknee compressor

The compressor is designed with a softknee and has four selectable attack and release times, as well as continuously adjustable threshold ratio (1:1 to 30:1) and 20 dB makeup gain controls.

Attack times range from 40 milliseconds to 0.5 seconds. Release times range from 40 milliseconds to 4 seconds. The attack and release times have been engineered to reduce hole punching from very short transients.

A 10-millisecond hold circuit is used to reduce distortion common with LF signals. There is also a hardwired bypass button. A simple gate follows with one threshold control and an LED.

The EQ section offers (12 dB for each of the four bands. The LF band is a basic shelving circuit with selectable corner frequencies of 60 Hz, 120 Hz, 250 Hz and 500 Hz.

The Low-Mid (LM) band is a peak/dip circuit with frequencies set at 250 Hz, 500 Hz, 1 kHz and 2.2 kHz. The High-Mid (HM) operates similarly, but at 1.5, 2.2, 3.5 and 5 kHz.

The HF band operates as a shelving circuit with corner frequencies at 2.2, 5, 8 and 12 kHz. The EQ section can be bypassed with a switch. The Q is fixed at 0.5, or half an octave.

A four-position metering switch allows input, output, output+10 or gain reduction measurements to be sent to the small, backlit VU meter. An EQ/Pre switch allows the EQ and compressor to switch places in the chain. The link switch allows two units to be connected for stereo operation or for one Radius 40 to duck the other when mono signals are applied to each unit.

The sound of the Radius 40 depends on how much tube drive is used. Even with maximum drive, the Radius 40 presents a clear sound that is not particularly dark or thick.

See RADIUS, page 35 ▶

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For 25 years, Radio World has been your trusted resource for product news and information. Starting next year, we're giving our valued readers the opportunity to express their opinions about the products that affect their daily lives. Here's your chance to sound off and tell the industry which products work for you.

**Here's How It Works**

In early January, you will receive Radio World's 2002 Industry Source Book, our annual vendor directory. Included with each Source Book will be a ballot that lists new radio broadcast products in 12 categories. The ballot will include Web URLs so you can learn more about the nominated products.

Then, you will be asked to vote for your favorite product in each category via a mail-in or fax ballot or through an online Web site ballot. Radio World will announce the winners in our April 10, 2002, issue and at the NAB2002 show.

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While submitting your ballot for the Readers' Choice Awards, your name automatically will be entered in our Readers' Choice Sweepstakes 2002. Due to the overwhelming response of our Silver Sweepstakes this year, we've decided to extend the contest. This means that 26 more great products will be given away in 2002. We will choose the winners in random drawings and announce them in every single issue of Radio World next year.

*Watch for your copy of the 2002 Source Book & Directory coming in January. Get ready to vote for your favorite products and win!*

# Radius

► Continued from page 34

With my Neumann TLM 103 microphone and GML preamp, I normally have to roll off the bottom of the mic and keep the combination away from overly sibilant voices. The Radius 40 contained both top and bottom. No rolloff was needed. The top was natural and not overly bright.

## Subtle brightness

With no tube drive, the voice was smooth and well-balanced. Using the proximity effect of the TLM 103, the voice was thick, but not overbearing. With tube drive instead of a smoothed top, the voice took on a subtle brightness and the bottom was more contained.

I then tried an E-V RE27 N/D with no EQ adjustments on the microphone, and found it to require at least 3/4 gain to light the Tube Drive light. That worked quite nicely, with the Radius 40 smoothing the top edge of the RE27 N/D. With the RE27 N/D high-frequency tilt switch on, the microphone was a bit too muted for my taste, but might work on a thin voice.

I particularly liked the way my voice sounded using a Neumann U 89 in hypercardioid mode. I had judged the U 89 as a bit darker than I liked and have been using a TLM 103 and Schoeps Mk 41 for V/O recently.

The U 89 was a good match for the Radius 40. Even without the tube drive, the Radius 40 put a nice little edge on my voice. The tube drive and compressor added slightly to the edge.

Plugging into the front-panel instrument input, my Martin Gold + pickup under the saddle of my D28S Martin guitar produced its usual slightly plasticky sound with no tube drive. Adding tube drive smoothed some of the artificial-sounding spikes, making the Martin sound more like it does in open air.

the Martin guitar and a Fender Thinline Telecaster with humbucking pickups. Although the more aggressive settings did begin to sound gnarly, it was difficult to get the compressor to sound really bad, even with high ratios and occasional swings to over 15 dB of gain reduction.

## Limited but useful

The four-band EQ, although limited by its preset choice of frequencies, is useful in generally shaping the audio that passes through it. Having the

**I found the compressor audio artifacts to be as mild and subtle as the effect of the tube drive.**

I found the compressor audio artifacts to be as mild and subtle as the effect of the tube drive. Across a variety of attack, release and ratio settings, the Radius 40 remained relatively constant in sound, with a slight edge and tightness developing as I dialed in more gain reduction and faster attack and release times.

I tried the TLM 103 and U 89 mics,

choice of swapping the compressor and EQ is a handy feature, although I usually like the EQ ahead of the compressor.

The expander/gate is really a gate, and although the manual says the below threshold is dropped about 24 to 30 dB, in my ears the audio simply disappears — and much too sharply. The point is, the circuit is a gate and what is needed is an expander that can work with the

**Product Capsule:**  
**HHB Radius 40**  
**The Voice Processor**

**Thumbs Up**

- ✓ Easy-to-use control interface
- ✓ Control over how much tube is heard
- ✓ Tamed the top and bottom of my TLM 103

**Thumbs Down**

- ✓ Gate should be an expander
- ✓ An effects insert would be nice

Price: \$749

For more information contact  
HHB Communications in  
California at (310) 319-1111  
or visit [www.hhbusa.com](http://www.hhbusa.com).

compressor.

The Radius 40 is certainly not a bargain box, but there are plenty of pre-amp-only boxes selling for around \$1,000 per channel these days. The added features of drive, compression and EQ make the \$749 list price reasonable.

The controls are easy to see and use. Although the frequency response may not be DC to light, the three tubes keep the signal clear, well-behaved and not soupy at all.

Visit Ty Ford's Web site at [www.jagunet.com/~tford](http://www.jagunet.com/~tford) and check out voiceover samples and audio equipment reviews.

**PRODUCT GUIDE**

## Equi=Tech Revamps Its Rack Gear

An upgrade of its professional rack systems products was announced recently by Equi=Tech.

The new transformers have reduced line impedance, which the company says improves current delivery and results in a brighter, cleaner sound quality, especially in the mix-down stage of recording.

Other new features include a more-accurate three-digit LED voltmeter on the front panel and a fail-safe, non-GFCI twist-locking feature for live sound applications. Equi=Tech also added blue LED indicator lights.

For more information on the revamped product line, contact Equi=Tech in Oregon at (541) 597-4448 or visit the company on the World Wide Web at [www.equitech.com](http://www.equitech.com).



## New Original Stock Available in Catalog

Antique Electronic Supply recently announced that its 2002 catalog is now available and being mailed to active customers automatically. It can also be requested via e-mail to [info@tubesandmore.com](mailto:info@tubesandmore.com).



The catalog, which has grown to more than 100 pages with this edition, includes many new products. New items include products from the Jensen Vintage Series line of speakers, Weller and Xcelite tools.

Antique Electronic Supply offers products for all types of tube gear, including vacuum tubes, transformers, capacitors, parts and supplies and literature. The company has a large inventory of NOS tubes, and also carries current production tubes. The annual catalog is supplemented by quarterly flyers that introduce new products and update customers of sale items.

For more information contact Antique Electronic Supply in Arizona at (480) 820-5411 or (800) 706-6789 or visit them on the World Wide Web at [www.tubesandmore.com](http://www.tubesandmore.com).

**Reader's Forum**  
*can be found on page 54.*

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# Buyer's Guide

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Radio World

Antennas, Towers & Transmission Support

December 19, 2001

USER REPORT

## PSI Delivers Town and Country

by Richard Potyka  
GM/Owner/Chief Engineer  
KRXS(FM)

**GLOBE, Ariz.** In late 1999, KRXS(FM), of which I am the co-owner, general manager and chief engineer, received an upgrade from C3 to C2.

Our station, at 97.3 MHz, is on a mountaintop. We wanted to cover our city of license seven miles away and some 5,000 feet below us, and also to put a good signal into Phoenix, 50 miles away. This became a real challenge for a single antenna system.

I needed both "town" and "country" coverage from one site. Our 8,000-foot AMSL and 3,100-foot HAAT presented a number of issues.

Winters here are severe, with ice, snow and high winds. The site is snowbound for three months a year.

### Brutal weather

We needed a robust design that is mechanically sound and does not detune with two inches of ice.

Further, summers are tough, with metal surface temperatures reaching more than 160 degrees Fahrenheit and with high UV radiation.

**The antenna has stayed perfect through two winters and a forest fire.**

I also wanted a design that was broadband and phase-linear to accommodate IBOC FM in the future.

A week of searching for data and proposals during an NAB convention lead me to **Propagation Systems Inc.** I have seen several of its antennas in LPTV applications. These had performed well, were rugged and were moderately priced.

PSI offered a variety of FM antenna designs and options. Working with their engineering staff, I began to match our needs with their designs.

Again, previous experience indicated a need for true circular polarization to minimize multipath and fading in our close-in mountain communities while developing a clean pattern on the horizon. The rototiller-style bay produces an excellent circular pattern, is moderately broadband and has a weather-protected internal feed system.

One problem we didn't have was power handling. At our HAAT I need only 0.64 kW H/V ERP to make our C2 power. The PSI FMR series met our requirements; it had a 9-kW power-handling capability.

I selected a two-bay, 0.5 wave spaced model for KRXS. Gain was 0.7, so we needed only 1,100 W TPO to meet our rated power counting antenna gain and line loss.

### Exposure limits

The two-bay design uses 13 feet of vertical tower space, weighs 90 pounds and has a nominal 180 lbs. wind load using the 50/33 standard. Each bay has a dual steel U-channel mounting bracket with four U-bolts to support heavy ice loads.

Electrically, the two-bay 0.5 wave was only 6 dB down at -35 degrees, which produced city-grade coverage in our home city. Directly below the antenna, where I have a translator receive antenna operating at 98.3 MHz, our signal was 25 dB down in the null, which prevented front-end overload.

We easily meet RFR exposure limits for personnel on the ground 90 feet below the center of radiation. This is a benefit for multi-user sites like ours. The antenna has a bandwidth of 600 kHz at the 28-dB return loss (R.L.), and was 25 dB R.L. at +/-750 kHz.

I also had the antenna 150 kHz high (-30 dB R.L.) to help compensate for ice detuning.

Two months after the order was placed, the truck arrived with a beautiful, shiny antenna. I uncrated the antenna and checked the instructions and counted parts — nothing was missing. The installation manual and performance data for our antenna were among the best I have received.

After preparing the site with a small temporary antenna and back-up transmitter, construction started at 10 a.m.

The old single-bay 'tiller was removed, a new tower section added and up went the pieces of the

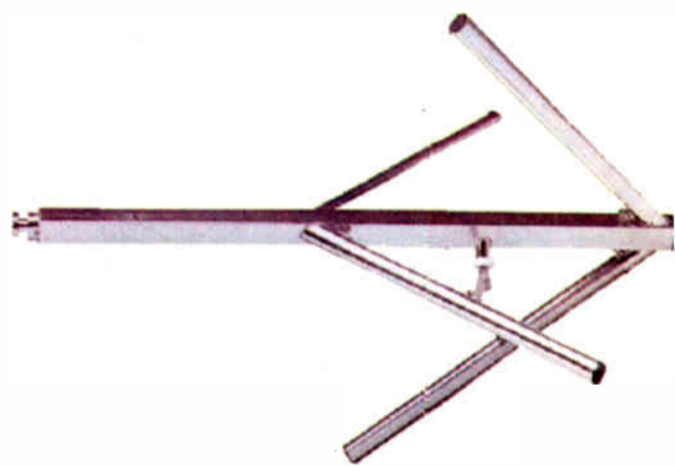
See PSI ANTENNA, page 42 ▶

USER REPORT

## Superior Coverage From Nicom

by Jim Turvaville, CBRE  
Director of Engineering and Expansion  
WAY-FM Media Group Inc.  
Network Operations Center

**NASHVILLE, Tenn.** WAY(FM) had a terrestrial translator operating in the Chattanooga, Tenn., area for several years, but when we received the opportunity to have an outlet for our second satellite-fed



The Nicom BKG-77 Antenna

signal, we were anxious to improve our programming quality.

Because vertical real estate is so valuable, it quickly became apparent that diplexing our signals into a single antenna was the only logical move. But with the two signals so widely separated — 90.9 MHz and 101.5 MHz — I feared that no antenna

See NICOM, page 38 ▶

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World Radio History

SPECIAL REPORT

# CFA Holds Promise for AM

by Robert E. Richer  
President  
Crossed Field Antennas Ltd.

**FARMINGTON, Conn.** AM radio faces challenges that cause difficulties for its broadcasters. They must manipulate their coverage area with multiple towers, project signals through the ground, cope with regulations covering interaction with stations on the same frequency and reception that varies depending on the time.

Dealing with these difficulties can require expensive real estate and insurance. In addition, there are problems of near-field radiation that cause troubles with nearby electrical equipment and the high voltages of standard mast antennas can cause problems.

TV waves do not bend around the earth's curvature, thus the higher the antenna is in the air, the further the signal can "see."

AM puts most of its signal into the ground, but also sends some through the air. This is apparent after sundown, when the ionosphere acts as a reflector, which is why distant AM stations can be picked up at night.

## Real-estate squeeze

To put a signal into the ground, most AM stations require an underground system of copper cables. These radials conduct the energy into the earth. AM stations are often designed to be directional in their signal patterns. This is done to protect other, distant stations on the same frequency.

Another class of AM stations in the

35 feet and can be mounted on a platform 25 m square.

The man responsible for inventing it about 10 years ago is Maurice Hatley, a professor of electrical engineering at a college in Scotland. It was perfected by one of his students, Fathi Kabbary.

There are now 10 CFAs in Egypt, with an additional 40 to be constructed. The Egyptian government's goal is to eliminate all MW and LW mast antennas and replace them with CFAs.

Two are being built in Brazil and one is operating in Italy. We also have a "test" antenna being completed in the United Kingdom. It will be used as a demonstration for interested engineers and as the benchmark for submission to the FCC so we can get approval to sell CFAs in the United States. We're about a year away from FCC approval.

One of the goals of the U.K. antenna is to measure the CFA's efficiency. This is an area of interest in that most engineers calculate that the CFA might be a good radiator, but is probably poor on efficiency. We don't believe this, based on past history, but we will be careful in our testing.

By switching to CFAs and eliminating existing AM towers, broadcasters can reap huge benefits. They can sell real estate and place the system on an existing transmitter building or downtown office roof. It requires minimal maintenance or painting. FAA, ground system, tower lighting and insurance problems, expensive riggers and near-field radiation will be reduced.

The CFA also can be configured to output little or no sky wave. Many stations that reduce power or alter patterns at sundown will no longer need to do so.

Many "daytimers" could operate full-time with nearly the same daytime coverage pattern. Having a full pattern 24 hours a day was considered unlikely until now. An AM station can now reach the same audience potential day and night.

The system also improves audio quality. The antenna has broadband capability, which allows an AM station to put out a cleaner, full-frequency sound, providing audio quality close to FM's. Within the limits of the typical AM receiver, the prospects of listener fatigue will be diminished.

Last, the antenna is more compatible with the injection of a digital signal. It will accommodate IBOC or DRM more easily than any existing AM transmission system.

For more information contact Crossed Field Antennas in Connecticut at (860) 676-0051.



**Crossed Field Antennas Ltd.** is addressing these issues with a new antenna. We are developing AM broadcast technology that will cut costs and improve quality.

To explain its advantages, however, we need to examine AM broadcasting's background.

AM is also known as medium-wave radio. MW and long-wave radio work on the same theory, but AM sits between 540 kHz and 1700 kHz, whereas LW is below 300 kHz. The higher on the dial an AM station is located, the more power is required to put out a comparable signal.

A 50,000-W facility at 660 kHz in New York can cover the entire eastern seaboard, but at 1280 kHz it would require 100,000 W to do the same.

Conversely, the lower on the dial, the greater the coverage. LW has proportionately greater coverage than MW. A typical LW station measures its coverage in hundreds of miles.

AM puts much of its signal through the air, but the most important method of dissemination is through the ground. FM, however, is dependent on line of sight. That's why FM antennas need to be tall. FM and

United States is known as "clear channel." These are protected from having any other station on the same frequency within a radius of 800 miles. These "clears" are normally high-power, with tall towers, but even they share their frequencies.

WCBS in New York City at 880 kHz, a clear-channel Class-A frequency, is an unlimited 50-kW station, meaning that every other station on that frequency must protect WCBS. But there are still 25 other stations on the 880 kHz clear-channel frequency, some with daytime power as low as 220 W, and some that go off the air at sundown.

In sum, we have the clears with tall towers and we have other AM stations with as many as 12 towers to shape their patterns. All use up valuable real estate.

Towers are also an environmental problem because they radiate high voltages and affect nearby radios and other household appliances.

We've designed the Crossed Field Antenna to eliminate most of these problems. It does not require significant height, needs no ground system and can be designed to shape the pattern. A typical CFA radiating 50,000 W will be less than

## Nicom

► Continued from page 37  
could meet our budget and our needs.

After several phone calls to antenna manufacturers, that fear began to become a reality. It seemed that broadband antennas were indeed available, but they were only in high-power models, most of which only had 6-8 MHz of bandwidth, and they were by far out of the budget to operate a 10-W ERP FM translator.

While talking to another antenna manufacturer and explaining my need, they pointed me to Nicom as the only source they knew that made an antenna with sufficient bandwidth for my needs. Sure enough, Nicom had 16 MHz of bandwidth on its BKG-77 antenna. I ordered one of the antennas and got ready to put it to the test. We already possessed a diplexor for this particular system, so we were ready to hit the air as soon as the antenna arrived.

We removed the 101.5 narrow-band antenna, replacing it with the BKG-77. Downtime was about 20 minutes, and we were back up with the signal. I fed the transmitter directly to the antenna through a wattmeter and found a perfect match. Then I put the diplexor in line and the transmitter still saw a perfect match.

I would not have thought that removing a narrow-band antenna and replacing it with a broadband unit would make such a difference in our signal, but it did. We immediately noticed more coverage and penetration on the 101.5 signal. With the diplexor in line, the 90.9 signal had equally exceptional coverage.

Being satisfied with my experience on that location, when a second opportunity arose I called Nicom again. This time a BKG-77 and an FSD 800 Starpoint Diplexor were ordered to combine 88.1 and 97.7 MHz. Again we got simple installation and superior signal coverage from the system. Neither signal received any interference from the other in the diplexor, and field coverage was increased from that of our narrow-band antennas.

I have yet one more BKG-77 and FSD

800 Starpoint Diplexor sitting ready to install to combine 91.9 and 104.7 MHz. With the track record of Nicom so far, I expect that this will be as simple and painless as before, and my signal coverage will be greatly enhanced.

The Starpoint Diplexor is rated at 800-W input, and is available up to 5-kW input for higher-power combinations. I use them at much lower power levels, typically 30-50 W for our translator sites. No field adjustments were required, and they come ready to accept my transmitter and antenna connections.

The cost of the Starpoint Diplexor was about half that of the competition.

The BKG-77 is a sturdy antenna and seems well-suited to our moderate climate for many years to come. In all three of my installations we removed a narrow-band antenna and replaced it with the BKG-77, taking up the exact same tower space as its predecessor. Because all of our tower leases are based on vertical space and cable use, we have been able to double our operations at the three sites with no change in monthly tower rent.

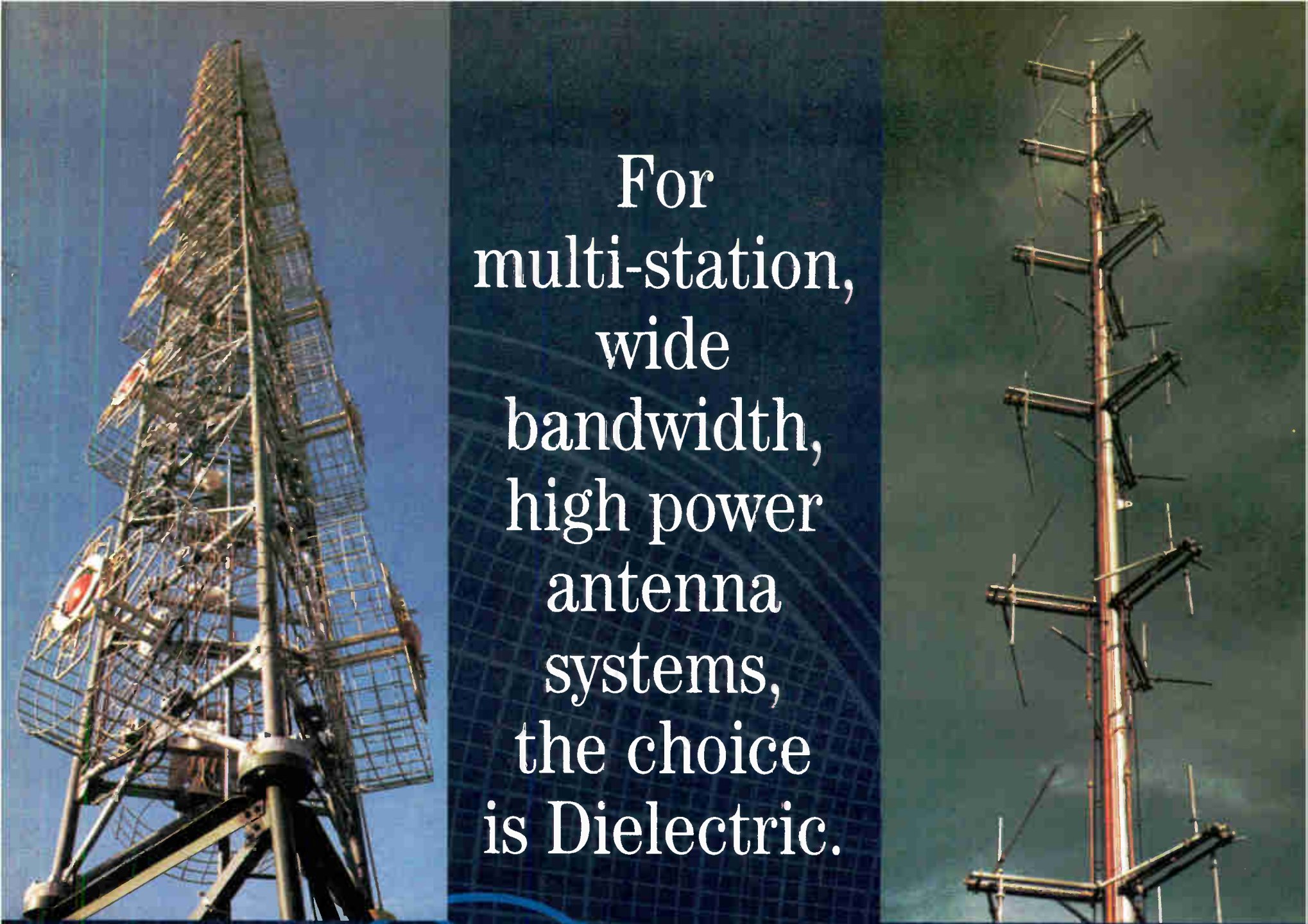
For a nonprofit group, these monthly tower rental savings and the exceptional value of their products have made us pleased with everything we have used from Nicom.

I have also purchased the NT30 exciter, which is frequency-agile — even by remote control — and fed it to the Nicom NA 500, a 500-W solid-state amplifier, for excellent coverage for our newest Class-A facility. It feeds a three-bay Nicom BKG-88 antenna, where "unexpectedly good" would be an understatement as to how well it covers my service area.

Because this is a remote mountaintop site, reliability is required, and I can report zero down-time on the system since we signed it on in August.

I have four other BKG-88 narrow-band antennas in use, and find excellent coverage from all of the stations. For value and quality, Nicom is my first choice.

For more information contact Nicom in California at (619) 477-6298 or visit the company Web site at [www.nicomusa.com](http://www.nicomusa.com).



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## TECH UPDATES

**LBA Isolates Signals From AM Towers**

LBA Technology Inc. is shipping the latest generation of the CoLoCoil AM tower site wireless isolation system.

CoLoCoils permit the installation of 3G, cellular, PCS and other wireless antennas on existing AM broadcast towers. They allow AM broadcasters to rent previously unusable tower space.

The system incorporates low-loss coaxial transmission lines and other components into a low-maintenance system. More than a dozen coaxial, power and control cables can be isolated with negligible impact on most AM towers.

Site acquisition is simplified and zoning laws can be accommodated more easily when using the isolation system. Time-to-market and costs of deploying new sites are reduced compared to construction of "greenfield" sites. The system is weatherproof and comes with modular pad-mount assemblies.

For more information contact LBA in North Carolina at (800) 522-4464 or visit [www.Lbagroup.com](http://www.Lbagroup.com).

**ERI Creates Two New Antenna Systems**

Electronic Research Inc. has debuted two antenna products, the Cogwheel Antenna Design for systems integration and the Axiom antenna, a multistation antenna platform.

The Cogwheel Antenna Design integrates an antenna, structure and feed system into an entity providing identical broadcast coverage and signal quality for participating stations. This design suits it for multichannel operation over the FM band. System VSWR of 1.1:1 is typical at each input frequency.

The broadband Cogwheel design accommodates 15 high-powered radio stations. ERI provides the combining equipment required to feed the combined signals from 15 stations into a single-transmission line system. The newest addition is the three-around style with the Cogwheel's integral frame, which supports top-mounted, double-stacked TV antennas.

The ERI Axiom antenna is a multistation, side-mounted antenna platform. It can accommodate more than 10 stations. It incorporates three-stage transformation, shape-factored elements and feed-point reactance compensation.

The Axiom optionally features a "continuous solid contact" interbay connection system designed to eliminate normal wear-and-tear bullet failures.

For information contact ERI in Indiana at (812) 925-6000 or visit [www.ERInc.com](http://www.ERInc.com).



ERI's Axiom Antenna Platform

**Orga Upgrades Obstruction Lights**

Orga is enhancing its series of tower lights for use by broadcasters who need to fill the FAA requirement for obstruction lighting. The enhancements are newer software versions for the lighting systems. The Communications Interface Processor, or CIP, version 1.2 display menu now has an "active stations" feature, which comes in reverse color if the fieldbus is reversed, and a logging chip.

The strobe beacons ship with software version 1.22 with STIX ("special technology for the ignition of xenon tubes") as the default setting, thereby eliminating ozone generation in the flash head. Bulb life has been increased. A discrepancy in photocell readings that could result in a "system wrong intensity step" message under abnormal conditions was also corrected.

Future developments include a CIP-controller software upgrade that will allow it to display the status of each flash head through 12 parameters. Orga is planning a high-intensity system in the coming months.

For more information contact Orga in Texas at (281) 358-2544 or visit [www.orga-aviation.com](http://www.orga-aviation.com).

**Harris Alters Rototiller Design**

Harris' Skytiller circularly polarized FM antennas have modified the basic "rototiller" design to improve functionality and reliability.

The Skytiller's construction features a heavy wall element stem with welded joints; solid insulator supports on inter-bay lines with no "pin" type insulators or punching of the center conductor required; bronze mounting blocks; and an improved Lexan end seal.

Skytiller's electrical performance works for FM, and the company says it will work for IBOC DAB in the future. With field tuning the Skytiller has a low-standing wave ratio of 1.1:1 or less, + 200 kHz per given channel.

The antenna has a horizontally polarized, free-space, omnidirectional radiation pattern. Circularity is specified at +2 dB when the antenna is top-mounted on a steel pole with a diameter of 14 inches or less. An optional fine-matcher input transformer gives the capability to fine-tune the antenna system quickly without disconnecting the coax or disassembling the system.

Skytiller is offered in two versions in arrays of one to 14 bays. The SKM series is a medium-power antenna with maximum inputs power ratings from 9 to 18 kW. The SKH series is a high-power version with maximum input from 32 kW to 120 kW.

Both series come in end-fed and center-fed configurations with 1-5/8-inch, 3-1/8-inch or 6-1/8-inch EIA input connectors depending on the model and power rating. The antennas are suitable for multiplex use by two or three stations within a 6-MHz bandwidth.

For more information contact Harris Broadcast in Ohio at (800) 622-0022 or visit [www.harris.com](http://www.harris.com).

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The 1.8-m Comtech Quick Deployable Antenna

## TECH UPDATES

## Comtech Builds Portable Antenna

Comtech Antenna Systems has added a new antenna system to its line of products. The Quick Deployable Antenna is a compact system for portable satellite requirements.

The satellite comes in 1.2-m or 1.8-m apertures and, according to the company, can be assembled by one person in less than 30 minutes. The reflector types are one-piece offset prime focus for the 1.2-m model and two pieces for the 1.8-m model. The 1.2-m model has a 41.8-dB gain at midband for Ku-band Rx and a 43.3-dB gain for Ku-band Tx.

The 1.8-m version has a 45.3-dB gain for Rx and a 46.8-dB gain for Tx. Its gain for C-band Rx is 35.4 dB.

The survival wind level is 55 mph

with ballast for the 1.2-m model and 45 mph for the 1.8-m model, while the operating wind is 45 mph and 35 mph respectively.

A system is packaged in two air-shippable cases. One case contains the feed system, tools and stabilizers and provides a base for the Elevation over Azimuth mount.

For information contact Comtech in Florida at (407) 892-6111 or visit [www.comtechantenna.com](http://www.comtechantenna.com).

## PM Group Touts Svetlana Line

The PM Group, comprising PM of America Inc. and PM Components Ltd., has been granted exclusive global distribution rights for Svetlana electron tubes.

PM of America Inc. announced the appointment by Svetlana of St. Petersburg, Russia, for the territories of the United States and Canada.

Svetlana says it is the largest power tube designer and manufacturer in the world and is known for its vacuum tubes.

The manufacturer targets the broadcast, amateur radio, wireless communications, medical, scientific and industrial markets. The PM Group said it will "continue the Russian tradition of bringing superior quality products to the electron tube industry worldwide."

For information contact PM of America in Tennessee at (901) 388-2424 or visit [www.svetlanausa.com](http://www.svetlanausa.com).

# 25th Anniversary Silver Sweepstakes

Enter to win one of 25 great prizes in Radio World's reader appreciation contest giveaway!

IMAS Publishing is celebrating 25 years of serving you and the radio broadcast industry. To mark this significant milestone, 25 of radio's leading equipment suppliers have teamed up with Radio World to express their appreciation.

Throughout 2001, Radio World will conduct 25 random drawings. Prizes and winners will be announced in every issue of Radio World all year long.



To become eligible to win, you need to complete these three easy steps:

1) Register online at our Web site [www.rwonline.com](http://www.rwonline.com)

2) Click the Silver Sweepstakes icon on our homepage

3) Fill out the electronic entry form — that's it, you're done!

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Contest Rules: To enter the drawing, simply register online at [www.rwonline.com/sweeps](http://www.rwonline.com/sweeps). 25 drawings will be held throughout the year. Contest ends December 19, 2001. One prize per winner. All contestants MUST reside in the United States and have a valid mailing address. Winners should receive prizes within 30 days of notification, however, actual delivery time may vary and is not guaranteed by IMAS Publishing. Federal, state and local tax laws may apply to prizes and are the sole responsibility of the winner.

## PSI Antenna

► Continued from page 37

new PSI. Our tower guy was delighted. Every part fit exactly. The tower clamps and brackets required *no* hammer tweaks. RF fittings were sealed and secured.

I applied a 20-W exciter to the new feedline and antenna. At first I thought we had a dummy load still in place. No measurable reflected. Then we tried the power amp and put 1,100 W in, with less than 3 W reflected. Perfect! We were done by 4 p.m.

The antenna has stayed perfect through two winters and a forest fire. Even the pink fire-retardant slurry didn't bother the antenna surface and insulated feed spacers.

Our nonpressurized operation has proved successful. A recent network analyzer sweep of the antenna showed no degradation in either return loss (>25 dB) or center frequency.

The resulting C2 upgrade performance improvement in Phoenix was better than predicted (+7 dB). The close-in local signal penetrates buildings more effectively than stations located in town. Our "lookdown" location eliminated multipath. Coverage through the mountain roads to the eastern Arizona recreational areas is as good or better than the big "Cs" out of Phoenix.

PSI brought the KRXS(FM) "town and country" format to all of central Arizona with a cost-effective antenna that was built, tuned and performed exactly as quoted.

For more information contact PSI in Pennsylvania at (814) 472-5540 or visit [www.psbroadcast.com](http://www.psbroadcast.com).



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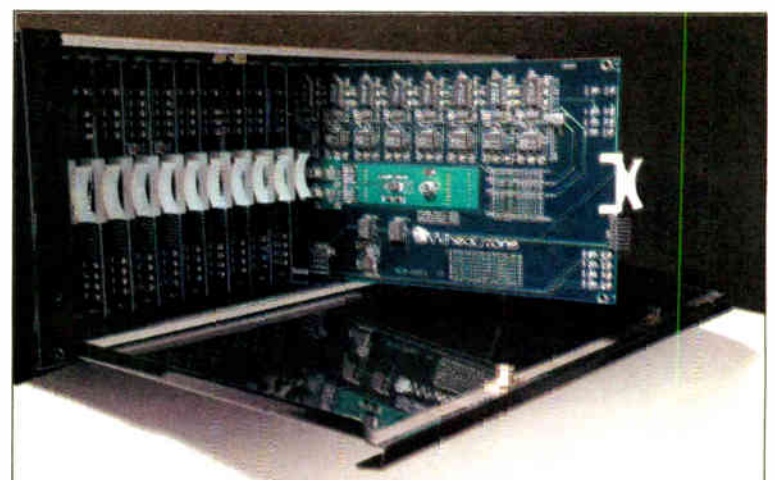
THE 2001 MAKES AUDIO NETWORKING PRACTICAL. It's simple to install, easy to learn, and certain to reduce system costs. Compact enough for small applications, yet stackable for tremendous growth potential, it's design consists of 7" rackmount digital routing cages, each capable of handling 512 simultaneous audio channels on its backplane.

Units can be stacked to suit particular card complements (analog or digital input and output cards or optical network cards) but more significantly cages can be separated by great distances and network their audio through either bidirectional fiberoptic links or a single CAT-5 wire. **ONE INTERCONNECT DOES IT ALL:** 64 channels of simultaneous bidirectional digital audio, intercage communication, X-Y controller commands plus auxiliary RS-232 data streams. This single interconnect between your studio and central rackroom can save you tens if not hundreds of thousands of feet of wire in a typical installation.

The 2001's graphic based setup software is intuitive and easy to use, with all the authorization and security levels you could want. And of course we have a full

complement of control panels and PC applications to choose from—all designed for straightforward operation and a rapid learning curve.

With 25 years of experience, Wheatstone has the infrastructure in place to help you build your OWN infrastructure. Contact us for answers.



**MIXED SIGNAL SWITCHING** is easily accomplished with a choice of AES digital or ANALOG 24-bit A>D input cards, and of course 24-bit digital or 24-bit D>A ANALOG output cards, all of which can be serviced from the front of the cage. All signals are routed entirely in the digital domain.

## TECH UPDATES

**Shively Eyes IBOC**

The Shively Labs IBOC filter-injector system was designed to give FM broadcasters a cost-effective solution to digital conversion.

The system uses Shively's FM combiner design technology and incorporates a feedback loop design to produce a filter that fits in a 24-inch square footprint.

It is compatible with Ibiquity iDAB technology. Shively is licensed to use Ibiquity's trademark.

The Shively IBOC filter was designed to address concerns about analog power loss, group delay distortion and increased power and air conditioning consumption, to help keep the costs of IBOC conversion down.

The filter is built to work at any size station. The analog I/O of 3-1/8-inch EIA and digital input of 7/8-inch meet the needs of most class-C installations and can be converted down for smaller stations.

The filter insertion loss is 0.75 dB for the digital signal. The injector coupling loss is 0.5 dB for the analog and 10 dB for the digital signal.

Shively also has available a technical paper that addresses the trade-offs involved with various filter solutions being offered in the market.

For information contact Shively in Maine at (888) SHIVELY or visit [www.shively.com](http://www.shively.com).

**New Beacons by TWR**

The TWR Lighting division of o2wireless Solutions Inc. offers the "E-series" medium-intensity dual red/white strobe beacon system for obstruction lighting.

The lighting system meets FAA and FCC guidelines and is constructed to ISO 9000 standards. It is built of lightweight aluminum and stainless steel with an acrylic lens, and offers system redundancy with fail-safe capability.

The unit uses minimal electronic and no electro-mechanical moving parts in its beacon. It has an integrated Remote Monitoring System, which can be wired or wireless. Plug-and-play technology makes for easy maintenance. Features include a lockable stainless steel NEMA 4 enclosure with a screen-printed back panel and an NEC-, UL- and UV-rated strobe cable.

For information contact o2wireless in Texas at (713) 973-6905 or visit [www.o2wireless-twr.com](http://www.o2wireless-twr.com).

**Satellite Export Ready for Digital**

As radio moves more toward digital compression, the need for digital-friendly satellite equipment is increasing.

Satellite Export markets its Patriot Antenna Package as suitable for this market.

For C-band applications, a minimum size of 3.8 m is needed for good reception. The Patriot Antenna is two-degree compliant and will not warp or bend. The Patriot 3.8 m antenna with phase-locked LNbs and a TI filter is among the company's offerings.

For more information contact Satellite Export in Michigan at (517) 629-5990 or visit [www.sepatriot.com](http://www.sepatriot.com).

**System One Devoted to Broadcast Towers**

System One Communications is a full-service tower company founded in 1988 and based in Houston. It caters almost exclusively to the broadcast industry.

The company says it has done work for most of the major broadcast groups and many independents. It provides tower erection/construction services, tower and site maintenance, antenna services and related services.

Construction of AM directional sites is a specialty. Turnkey construction of new sites includes land clearing, road building and excavation, all done in-house.

System One uses advanced tower erection and maintenance equipment. Hoists are personnel-rated and have two-way radio systems. Hoists used on towers over 1,000 feet have video systems to give the operator an unobstructed view of personnel and loads.

Tower crews are equipped to provide maintenance and repairs. Services include guy-wire tensioning, tower plumbing, painting and lamp service. Microwave system installation is done regularly, with single hops up to 90 miles.

For more information contact System One Communications in Texas at (888) 625-5649 or visit [www.system-one.net](http://www.system-one.net).

**Rohn Offers Infrastructure Services**

Rohn Industries Inc. is a supplier of communications support structures and related equipment.

Founded in 1948, the company aims to provide for the requirements of the communications industry with a line of solid and tubular steel towers, tapered and flanged steel poles, equipment enclosures, telecom accessories and related products.

The company has expanded its Peoria, Ill., facility for tower and flanged pole manufacturing/galvanizing complex to include a tapered steel pole manufacturing facility.

Rohn also provides turnkey construction services including civil works, zoning and permitting assistance, tower, pole and enclosure foundations, installation, maintenance and inspections.

In Frankfort, Ind., the company manufactures small towers used for wireless cable, satellite antenna mounts, telescoping masts, universal telecom accessories and fencing.

In Bessemer, Ala., it makes equipment enclosures and concrete building systems, which are an alternative to traditional site-built structures. The systems can be expanded or disassembled and relocated as necessary.

Rohn products and services are used in some 55 countries. Internationally the company can provide site turnkey services, civil works and tower erection, plus warehousing and staging facilities.

For more information contact Rohn in Illinois at (309) 697-4400 or visit the company Web site at [www.rohnnet.com](http://www.rohnnet.com).

**SpectraSite Consolidates Tower Firms**

The SpectraSite Broadcast Group is a division of SpectraSite Communications. It owns, operates, makes and erects tall towers.

SpectraSite Broadcast Group was formed in 2000 by combining Stainless Inc. and Doty Moore. The company says it emphasizes safety, customer care and technical skill. It provides turnkey solutions for broadcast transmission needs.

Stainless Inc. designs and fabricates tall towers. It has registered professional engineers in 50 states and performs structural analysis and modifications, regardless of make. In 54 years Stainless has built 7,500 towers globally. According to the company, it built more than half the broadcast towers standing in the United States.

Don Doty and Patrick Moore originally founded Doty Moore, a founding member of the National Association of Tower Erectors. It has helped establish many current safety protocols and standards in use.

The company's accomplishments include work on broadcast platforms such as the Empire State Building, the Mt. Sutro Tower in San Francisco and The Hancock Building in Chicago.

For more information contact SpectraSite in Texas at (972) 550-9500 or visit [www.talltowers.com](http://www.talltowers.com).

**Teracom Releases Bandpass Filter**

Teracom Components has introduced a DAB Band L Bandpass filter for the use of radio stations abroad broadcasting in digital.

The filter uses dual-mode waveguide features to provide a low-loss, high-rejection filter for either the critical or non-critical Eureka 147 mask specifications. It is built with a stackable frame design, temperature compensation and silver-plated components. It can be used as an output filter and in Teracom's DAB channel combiners at powers of 2 kW.

It operates on a frequency of 1452-1492 MHz with an impedance of 50 ohms. Insertion loss is -0.7 dB at center frequency and -0.95 dB at +/- 0.77 MHz. Attenuation at +/- 1.8 MHz is -30 dB.

For more information contact Teracom in Maine at (207) 627-7474 or visit [www.teracom-c.com](http://www.teracom-c.com).

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The PX1 was designed to fill the needs of the low power or community broadcaster. Set-up and use is fast and simple with just 5 buttons to access all parameters - power, frequency, modulation, and more. The 2-line vacuum fluorescent display gives you "at-a-glance" verification of all important functions. The micro-controller continuously monitors frequency, temperature, deviation, etc. and makes subtle adjustments on the fly like a "virtual" station engineer.

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3. By the time you get an air-check in the mail, it may be too late to respond to the competition.

The TeleRadio beats those problems by letting you listen to both your station *and* the competition in *real-time*. If you have a TeleRadio, you simply dial it up from any phone. As soon as it answers, the internal radio begins playing down the phone line to you. You can control the radio by using the buttons on your phone. It's just like being there!

The TeleRadio even has a DTMF selectable external audio connection so it can be used as a standard telephone coupler too. An optional call progress decoder is available for using the TeleRadio on PBX analog lines and in areas that don't support CPC.

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The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but in a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII character strings.



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## TECH UPDATES

**Cortana's Stati-Cat Stops Lightning**

**Cortana Corp.** aims to help broadcasters by protecting towers and other equipment with a group of lightning-discharge products called the Stati-Cat system.

The products work on the principle of charge dissipation, providing a continuous low-resistance discharge path for the static electric charge found on tall structures. The Stati-Cat products reduce the high-voltage gradient between a cloud and tower that eventually leads to lightning.

The system includes the CN-1 Crow's Nest that sits on a standard beacon mounting plate. It covers 36 by 36 inches with 720 stainless steel discharge points and weighs 37 pounds. A diagonal bar with 264 points is available optionally.

The Stati-Cat SC-1 mounts on the top or sides of a tower with 120 points on an 18-by-2-inch bar. It weighs 6 pounds.

The Stati-Kitty SC-3 is designed to attach to a tower guy wire, which discharges the build-up of static on the wire. The unit reduces noise in receiver antennas. It has 75 points and weighs 8 ounces. The Stati-Tomcat SC-4 is used when SC-1s aren't adequate and the CN-1 isn't feasible. It covers 36 by 2 inches with 180 points and weighs 12 pounds. It can be used in multiples of four in applications where a CN-1 can't be used.

Equipment is made from anticorrosive 6061-T6 aluminum and stainless steel 304. Mounting hardware adapted to individual towers is provided at no extra cost.

For more information contact Cortana in New Mexico at (505) 325-5336.

**Dawn Filter Stops Military Interference**

After the Sept. 11 terrorist attacks, activity at United States military bases has increased. As a result, microwave transmissions from the bases and radar usage by military aircraft have dramatically increased, often interfering with the reception of satellite signals at nearby broadcasters.

According to the company, **DAWNco's** Model 7892 waveguide T1 filter with a bandpass of 3.7-4.2 GHz has had success in removing most of the interference.

The Model 7892 operates at RF before down-conversion, which prevents the generation of undesirable mixer products and receiver desensitization from interfering signals.

It was originally designed to suppress out-of-band interference on C-band receive antennas from coastal, marine or airport radar systems. The filter is installed between a TVRO feedhorn and the

LNB or LNA. Coastal and marine navigation radar frequencies of 2.9-3.65 GHz often wipe out transponders one through five in TVRO's near harbors. The airport altimeter band at 4.25-4.40 GHz interferes with channels 22-24 at TRVO sites near airports. The unit is less than six inches long and is installable under standard weather housing. It has insertion loss and group delay specifications that suit it to digital applications.

For more information contact DAWNco in Michigan at (248) 391-9200 or visit [www.DAWNco.com](http://www.DAWNco.com).

**Nott Prepares for AM IBOC**

**Nott Ltd.** says it is ready for in-band, on-channel digital radio.

If AM IBOC comes to pass, there will be a need for a broadband RF system including transmitter, matching network and antenna. Nott says it has an antenna that allows the full digital AM to pass without distortion.

Folded unipole antennas have had varying results. Some have good bandwidth and others do not. Nott believes it has hit on the right combination to provide a unipole antenna with consistent results.

Using the Mullaney unipole computer program invented by John Mullaney of Mullaney Engineering Inc., Nott designed a unipole antenna to take into account geometric and mechanical factors that would enable the antenna to provide a bandwidth of 100 kHz. For best bandwidth the tower must be slightly taller than the classic quarter wave (90 electrical degrees). Depending on several factors of antenna geometry, optimum bandwidth is attained at a height between about 100 and 110 degrees.

The Nott antenna is suitable for the expanded band because it is less than 200 feet but has broad bandwidth for AM stereo or digital broadcasting. It may be installed on a tall tower at optimum height by detuning the tower above the optimum height.

For more information contact Nott in New Mexico at (505) 327-5646 or visit [www.nottltd.com](http://www.nottltd.com).

**Dielectric Offers Broadband Antenna**

Dielectric's line of DCR-Q broadband FM antennas are a series of side-mounted bays with quadrapole design that can support nine stations.

They are designed for high-power broadcasters who want side-mount azimuth pattern performance and a panel's broadband performance and high-power handling. The antennas use a branch-feed system that maintains RF phase in the one to 12 bays, regardless of different frequencies and reduced bay spacing. The radiator bays consist of four-dipole elements. The side-firing helix design provides circular polarization.

Bay spacing can be altered to provide a reduction in downward radiation, reduced tower space, a broader elevation beam, more constant azimuth patterns and other advantages. Reducing the bay spacing for a given number of bays decreases the gain proportionality.

The antenna is recommended for applications through 12 MHz of bandwidth. It can provide a broad, flat-frequency response usable for a range of frequencies. The power rating, depending on the model, is from 35 kW to 200 kW, with input line sizes from 3-1/8-inch single to 6-1/8-inch dual.

The DCR-Q element is constructed of heavy wall brass tubing, and the power dividers and bay feeders are copper and brass. The broadband nature of the element makes it stable under icy conditions, and the relatively low weight and windload suit it to towers that normally cannot support a master FM panel antenna or where the cost of reinforcing a tower is prohibitive.

The beam tilt and null fill can be customized depending on the size of the array.

For more information contact Dielectric in Maine at (207) 655-4555 or visit [www.dielectric.com](http://www.dielectric.com).

**Honeywell Offers New Lights**

**Honeywell Obstruction Lighting** recently released new medium-intensity and low-intensity LED-based obstacle lights.

The LEDGuard L-864 medium-intensity red beacon and the LED20 series of red lights meet FAA regulations for aerial navigation obstructions, including broadcasting towers. The LED-based lights last five to 10 times longer than incandescent lights and use 90-percent less power. They can be flashed or steadily burned.

The L-864 creates no EM/RFI and offers reduced cabling gauge requirements, conduit runs and wind loading relative to incandescents. As a retrofit, it mounts onto standard bolt-pattern installations and connects to existing controllers.

The LED20 series comes in single- and dual-light configurations with weather- and corrosion-resistant assembly. The wiring compartment eliminates additional boxes. Typical power consumption is 12.5 W at 120 V AC and 7.3 W at 12-24 V DC.

For more information contact Honeywell in California at (805) 581-5591 or visit [www.oblighting.com](http://www.oblighting.com).

**Pennsylvania Station Contracts New Tower**

WNCE(FM), a Cumulus Media station in Harrisburg, Pa, is home to a new structure from **Central Tower**.

The project included the tower manufactured by Central Tower and installation services for a new antenna and line, and demolition of the old tower by the Central Tower Services Division.

The tower top section was a frequency-matched tower section designed to work with a new Dielectric antenna.

Because the small lot did not permit positioning guy locations where they would best work with the azimuth pattern, the tower was designed with a rotatable pivot plate so that the top could be rotated, providing the best coverage for the broadcaster.

For more information contact company owner Dielectric in Maine at (207) 655-4555 or visit [www.dielectric.com](http://www.dielectric.com).



TECH UPDATES

### FM Broadcasters Offer LP Antenna

FM Broadcasters recently released its CP-250 FM transmitting antenna for the low-power, booster/translator market.

The CP-250 uses circular polarization and also is employed by full-power broadcasters as an emergency or stand-by antenna. It is fabricated of solid copper and stainless steel. Multibay arrays allow stacking for gain.

The DC-to-ground design reduces lightning damage. The CP-250's small profile makes it less obtrusive for environmentally sensitive areas. It is rated at 250-W input.

Also available as options are RF power dividers for two- through four-bay installations as well as a heavy-duty mounting system to improve storm survivability.

For more information contact FM Broadcasters in Washington state at (206) 229-7997 or visit [www.fmbroadcasters.com](http://www.fmbroadcasters.com).

### Mark Enters Spread-Spectrum Field

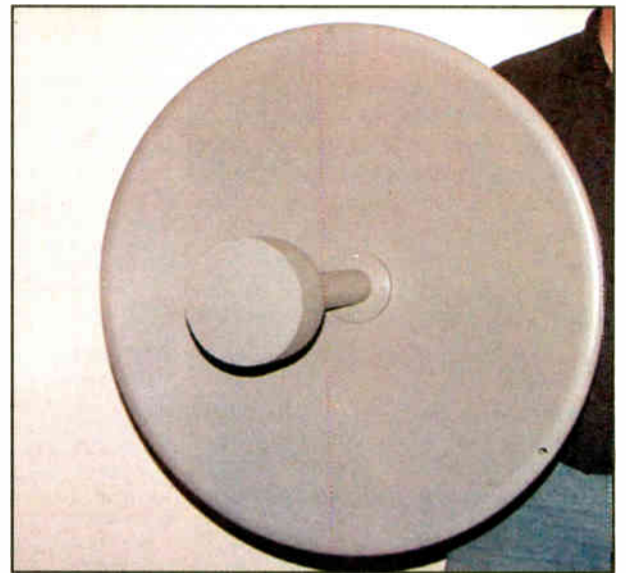
Mark Antennas has created a line of antennas to take advantage of growing interest in spread-spectrum (ISM/NII Band) radios.

Spread-Spectrum Parabolic Antennas are designed to be flexible and easy to install.

The antennas come in several spread-spectrum frequencies: 875-960 MHz, 2300-2500 MHz, 5.25-5.85 GHz and 5725-5850 MHz. Depending on the frequency range, the antennas come in grid or solid types with different flanges. Diameters range from 2 to 15 m.

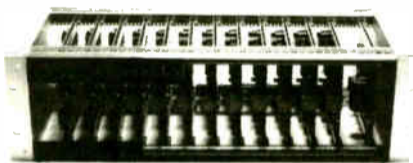
Features include field-selectable horizontal/vertical polarization, grid and compact grid for easy transportation and N-Type feed connector and an optional radome. Dual band models of the antennas are available.

For more information contact Mark Antennas in North Carolina at (828) 466-0412 or visit [www.csawrls.com](http://www.csawrls.com).



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**Ron and Beth Fruit of WRCO wrote us a letter about BSI's digital automation**

October 9, 2001

Dear BSI,

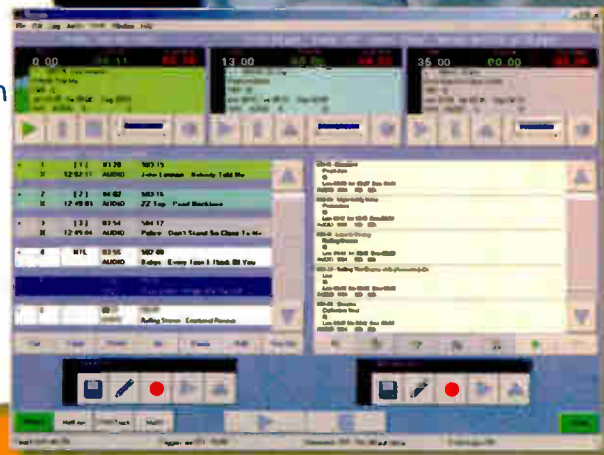
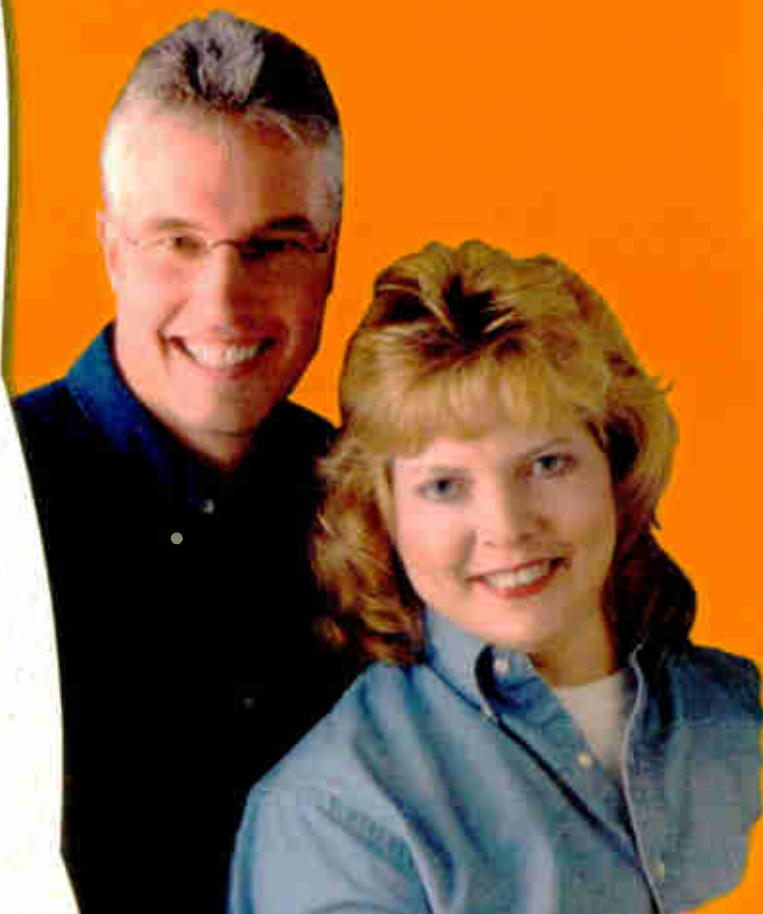
When WRCO Radio made the decision to go digital, our choice was BSI. I was really impressed and still am with your "try it before you buy it" philosophy. I became familiar with the software in the demonstration mode and was convinced it was the best choice for us before I ever wrote the check. After purchase, we were up and running in no time at all. I think it is clear that the BSI team has a strong grasp on what broadcasters want and need. I also appreciate the BSI philosophy that allows so much flexibility in hardware, although I have learned that following BSI recommendations is a very very good idea!

When we announced the change to digital at WRCO, several staff members were skeptical. Today, the comment often is, "how did we ever get along before?" or "I sure wish we would have done this even sooner."

We really appreciate the flexibility of BSI digital automation products. Our FM is live assist while the AM carries a satellite format. BSI products handle both tasks very well. When our farm network started offering mp3 downloads, we were able to route the material across our network and take full advantage of the opportunity in every studio, thanks to BSI. Similarly, as we have implemented change here at WRCO, BSI products have easily made the change with us. With BSI, I feel like I control the station and the software, not the other way around.

From the production studio to the control room, I can't imagine why we would ever want anything but BSI. It's reliable, user friendly software with the flexibility and power to make it a great investment.

Ron and Beth Fruit  
WRCO AM & FM Radio  
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**Shively 3 bay FM antenna on 105.5.** Cal Tharp, WASE, 519 North Miles St., Elizabethtown KY 42701. 270-766-1035 or email: [ctsharp@bigcat1055.com](mailto:ctsharp@bigcat1055.com).

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**Andrew 310' 1-5/8" foam coax, used but in good condition, on rolls with connectors, 2 available, \$1500 ea +shpg.** Larry Schrecongast, WTYM, POB 1032, Indiana PA 15701. 724-543-1380.

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**Phelps Dodge 1 bay antenna on 103.3 with radomes, \$250 +shpg.** Alex McEwing, McEwing Services LLC, POB 8260, Essex Jct, VT 05451-8260. 802-288-1103 ext 11.

**Rohn self supporting tower on ground, sections 16NH through 11N, 120', \$16,000.** Larry Schrecongast, WTYM, POB 1032, Indiana PA 15701. 724-543-1380.

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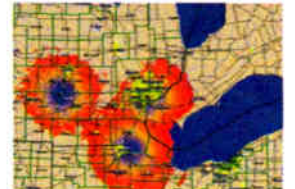
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**Radio World**

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<b>Distributor Directory</b>	<b>\$120</b>	<b>115</b>	<b>110</b>	<b>105</b>
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Call Simone Fewell, Ext. 154, Classified Ad Manager, to reserve space in the next issue.

Use your credit card to pay, we now accept VISA, MASTERCARD and American Express.

## ACTION-GRAM

### EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:

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 Yes  No

Signature \_\_\_\_\_ Date \_\_\_\_\_

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 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
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\*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

**Broadcast Equipment Exchange**

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# ADVERTISER INDEX

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PAGE	ADVERTISER	WEB SITE URL
19	AEQ	www.aeqbroadcast.com
12	Altronic Research	www.altronic.com
33	Armstrong Transmitters	www.armstrongtx.com
46	ATI	www.atiguys.com
3	Audio Precision	www.audioprecision.com
56	Audioarts/Wheatstone	www.wheatstone.com
55	Auditronics/Wheatstone	www.auditronics.com
46	Avcom-Ramsey Technologies	www.highpowerfm.com
22	BALSYS	www.balsys.com
24	Belar	www.belar.com
8	Bext	www.bext.com
23	Broadcast Software Int'l (BSI)	www.bsiusa.com
49	Broadcast Software Int'l (BSI)	www.bsiusa.com
46	Broadcast Tools	www.broadcasttools.com
28, 29	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
46	Circuit Werkes	www.circuitwerkes.com
48	Circuit Werkes	www.circuitwerkes.com
6	Comrex	www.comrex.com
7	Comrex	www.comrex.com
27	Conex Electro-Systems	www.conex-electro.com
1	Continental Electronics	www.contelec.com
30	Denon America	www.denon.com
39	Dielectric Communications	www.dielectric.com
46	Electronic Research Inc.	www.eriinc.com
40	Eventide	www.eventide.com
26	Harris	www.harris.com
10	Inovonics	www.inovon.com
36	Inovonics	www.inovon.com
46	J Squared Technical Service	jsquared@cdsnet.net
18	Klotz Digital AG	www.klotzdigital.com
16	Logitek	www.logitekaudio.com
21	MediaTouch	www.imediatouch.com
45	Moseley Associates	www.moseleysb.com
9	Omnia, a Telos Company	www.omniaaudio.com
37	PM of America	www.svetlanausa.com
17	QEI	www.qei-broadcast.com
5	Radio Systems	www.radiosystems.com
11	Radio Systems	www.radiosystems.com
35	RF Training Company	www.rftrainingco.com
46	rfEngineers.com	www.rfengineers.com
48	S.C.M.S., Inc.	www.scmsinc.com
41	Shively Labs	www.shively.com
15	Sierra Automated Systems	www.sasaudio.com
48	Silicon Valley Power	www.svpa.com
14	Sine Systems	www.sinesystems.com
31	Syntrillium Software	www.syntrillium.com
13	Telos Systems	www.zephyr.com
25	Telos Systems	www.telos-systems.com
48	Teracom Components	www.teracom-c.com
2	Wheatstone	www.wheatstone.com
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# Radio World

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## ◆ READER'S FORUM ◆

## XM excels

As a broadcast station owner, I can tell you John Lackness' letter describing XM Satellite Radio as WOW!, WOW!, WOW! is the understatement of the year.

They have over 100 "niche" channels, far more than any group of broadcast stations in a large city can offer.

The signal is very robust. The quality is tops. Nothing out there, including CDs, is better. I put one in my car here in New Jersey last week and haven't been back to terrestrial radio since!

Lackness, a technical sales manager at Marti, suggests that broadcasters

**'I put (XM) in my car here in New Jersey last week and haven't been back to terrestrial radio since.'**

had better take satellite radio seriously or what happened to AM can happen to FM.

Well, not so, almost. The only salvation terrestrial radio will have is the old standby, localism. The landscape has changed forever. There is no format a terrestrial station can render to compete with the satellites. Localism is the only answer to the "bird."

IBOC won't even get off the ground in the face of this new competition. It will be content, not quality, that saves the local broadcaster.

The landscape has changed forever in broadcasting. The only satellite that will suffer is the satellite-delivered, homogenized formats found on automated stations. They will be history.

Time to hang out the "Help Wanted" sign and get the local news console working again. Satellite is here and radio will never be the same.

Larry Tighe  
Owner  
WRNJ(AM)  
Hackettstown, N.J.

## Comedy World

My father, John Huntley, forwarded me a copy of your article, "At Auction, Tears of A Clown" (Nov. 7). He figured that I, a Comedy World employee who stuck it out to the end, would be interested in Radio World's take on the situation. I was an associate producer.

As someone who still hasn't received this mythical "final paycheck" you speak of, I wanted to fill you in on some facts. The company's last day of official business was Monday, April 23, the day they escorted us out of the building and had us schedule a next-day return (supervised) to pick up any belongings.

This supervision was deemed necessary because equipment — microphones, portable DAT machines, etc. — had "walked" over the prior weekend, when rumors of the company's imminent demise had spread through the employees. The company had attempted to divert bankruptcy, as we employees were told that official bankruptcy could hold up our "final paychecks." All employees were owed for the period from April 15 to the last day of the company.

Official bankruptcy proceedings were started, and the former employees were given unclear instructions on how it was getting taken care of. All we knew was that the sell-off of equipment would supposedly bring proceeds that would be used to pay us.

The auction, held in August, brought more money than was expected, and was rumored to be enough to pay all our wage claims. Some employees attended and bought equipment, in part to soothe wounds. I myself had a proxy bid placed on a pair of filing cabinets.

## A Holiday Wish

Happy holidays to everyone who makes up the diverse world of radio.

Merry Christmas to the part-time jock, called in to run the board and play holiday programs next Tuesday morning, Dec. 25, when everyone else is home with their families.

A festive Kwanzaa to the newswoman working the phones, calling the state police barracks, digging for stories on the slowest of news days.

Gentle wishes to the families who lost loved ones in the events of Sept. 11 this year, including the broadcast employees at the World Trade Center. May we never forget.

A warm and happy Hanukkah to the staff of the FCC commissioners, toiling in the Portals near the Potomac River, and to the guy who drives the little white truck for the FCC, watching out for signals that don't belong.

Feliz Navidad to the general manager who lost her job when a radio group cut back its staff, and to the employees who took across-the-board pay cuts this year because of the bad economy. May your job prospects improve very soon.

Happy holidays to the broadcasters who work for the U.S. military, fighting for a better and safer world in ways that we may never know. Thank you for your service.

A generous St. Stephen's Day to the supplier who hurries to the office on his day off because his best client went off the air in a snowstorm and needs a part rushed out overnight.

Happy New Year to the sales folk who keep the revenue coming in, the traffic director who keeps the station on schedule and the consultant who found a few extra ratings points in the last book.

And a special wish from the staff of Radio World to the men and women who keep our stations on the air, our engineers, the backbone and quiet heroes of radio stations across the country. May your pagers be silent and your holidays be peaceful.

Especially this year, with all our country has been through, we send our best wishes to all who make up the world of radio.

— RW

Through the network of ex-Comedy World employees, we were notified that we would have to file our own priority nonsecured wage claims to the bankruptcy court, even though our final payroll was supposedly submitted as part of the initial bankruptcy creditors. A former employee notified the rest of us that he was informed we might see this money in "two to four years."

It has been eight months since the demise of Comedy World, and, as far as I know, not a single worker (save for the upper management, possibly) has seen a dime of our owed wages.

Your story tells of dedicated board operators and engineers working past 5:30 p.m., April 23, because of their dedication. This is true — they were dedicated.

They were also promised additional money to stay around. And the employees who helped Barry Thomas take the equipment down were promised pay. As far as I know, these individuals have not received any money for these efforts either.

There was to have been a 341(a) meeting scheduled on Nov. 27, for attendance by creditors. As of this writing, I don't know how many former employees plan on attending, or

even how effective our presence at this meeting would be.

It would be nice to receive a final paycheck, but at this point, I have pretty much written it off as an unrecoverable loss. It's really quite sad that a lot of us retain bitterness, because we were dedicated to what could have been a unique radio venture, and I really liked working at Comedy World, loved the product and most of the people I worked with.

If you'd like to see how the other former Comedy World employees truly feel, check out the "excomedy-world" group on yahoogroups.

Jessica Huntley  
Los Angeles

## Write to Us

RADIO WORLD  
READER'S FORUM

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## Radio World

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## NEXT ISSUE OF RADIO WORLD JANUARY 2, 2002

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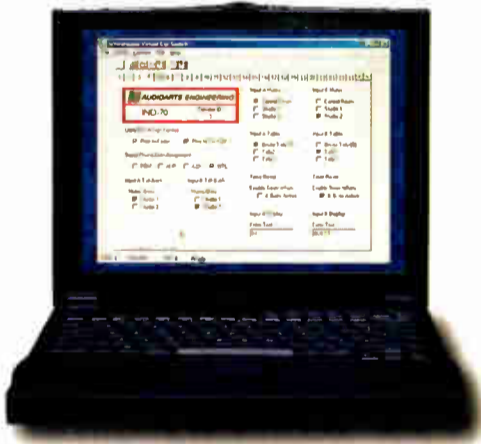
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